California High-Speed Rail Authority

RFP No.: HSR 13-57

Request for Proposal for Design-Build Services for Construction Package 2-3

Reference Material, Part E.3 – Fresno-Bakersfield Section 404 Permit Application

CALIFORNIA
High-Speed Rail Authority

January 29, 2014

Mr. Michael Jewell
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

RE: California High Speed Train, Fresno to Bakersfield Section, Clean Water Act Section 404 Individual Permit Application, USACE File No: SPK-2009-01482

Dear Mr. Jewell:

Please find enclosed a permit application for fills regulated under Section 404 of the Clean Water Act for the Fresno to Bakersfield Section of the California High-Speed Train System. On December 19, 2013, the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) submitted letters concurring with the Checkpoint C package of materials for this section. The package included the Summary Report to identify the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) and the Draft Compensatory Mitigation Plan. On January 17, 2014, USACE provided a preliminary response to the California High Speed Rail Authority (Authority) regarding compliance with 33 U.S. Code Section 408. This application requests a permit for the fills associated with the LEDPA for this section.

The following associated reviews necessary to support the permit decision are in progress:

- the USACE has been invited to be a signatory to the Memorandum of Agreement (MOA) that defines how the Authority, Federal Railroad Administration (FRA), Surface Transportation Board (STB), USACE, and California Office of Historic Preservation (OHP) will manage compliance with Section 106 of the National Historic Preservation Act; the MOA should be executed on or around April 1, 2014
- the FRA, in coordination with the Authority, is consulting with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act; a revised biological opinion should be issued on or around March 1, 2014, and;
- the FRA anticipates issuing a record of decision for the environmental impact statement for the section in early May of 2014.

The Authority requests that USACE respond by February 28, 2014, regarding the sufficiency of the information in this submittal.

Should you have questions, require clarification, or need any additional information, please do not hesitate to contact me at (916) 403-6934 or Mike Aviña, of the Project Management Team, at (916) 761-2768.

Sincerely,

Mark A. McLoughlin
Director of Environmental Services
California High-Speed Rail Authority

Electronic copies furnished:

Stephanie Perez, FRA
David Valenstein, FRA
Zachary Simmons, USACE
Kate Dadey, USACE
Jennifer Blonn, EPA
Sarvy Mahdavi, EPA
Clifford Harvey, State Water Resources Control Board (SWRCB)
Annalisa G. Kihara, SWRCB
Diana Gomez, CAHSRA
Gary Kennerley, PMT

CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report / Environmental Impact Statement

RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Fresno to Bakersfield Section

Section 404 Individual Permit Application, Permitting Phase 1

USACE File No:
SPK-2009-01482

January 2014

CALIFORNIA
High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

Fresno to Bakersfield Section

Section 404 Individual Permit Application

Permitting Phase 1 of the Fresno to Bakersfield Section

USACE File No: SPK-2009-01482

Prepared by:

California High-Speed Rail Authority and
Federal Railroad Administration

January 2014

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 31-AUGUST-2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Mark Middle - Last - McLoughlin	First - Kevin Middle - Last - Melanephy
Company - California High-Speed Rail Authority	Company - URS Corporation
E-mail Address - Mark.McLoughlin@hsr.ca.gov	E-mail Address - kevin.melanephy@urs.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 770 L Street, Suite 800	Address- 1333 Broadway, Suite 800
City - Sacramento State - CA Zip - 95814 Country - US	City - Oakland State - CA Zip - 94612 Country - US
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence N/A; b. Business (916) 324-1541; c. Fax	a. Residence N/A; b. Business (510) 874-3256; c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Kevin Melanephy to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

California High-Speed Rail Project, Permitting Phase 1 (PP1) of the Fresno to Bakersfield Section

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Please see Section 2 of the Supporting Material attachment.	Address N/A
15. LOCATION OF PROJECT	
Latitude: °N Please see attachment Longitude: °W	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality Please see Section 2 of the Supporting Material attachment

Section - Township - Range -

17. DIRECTIONS TO THE SITE

Please see Section 2.6 of the Supporting Material attachment.

18. Nature of Activity (Description of project, include all features)

The California HST System is a rail line proposed by the State of California to connect the major metropolitan regions of Northern California to those in Southern California. The HST is the responsibility of the California High-Speed Rail Authority (Authority), whose mandate is to develop a high-speed rail system that is coordinated with the state's existing transportation network. The Authority's plans call for high-speed intercity train service on more than 800 miles of tracks throughout California. The Fresno to Bakersfield Section is located in the San Joaquin Valley and is one of ten sections identified in the Statewide Programmatic EIR/EIS. The HST system includes the HST tracks, structures, stations, traction power substations, and maintenance facilities and train vehicles. The fully grade-separated, dedicated track alignment would allow operating speeds of up to 220 miles per hour (mph), and make a trip from Los Angeles to San Francisco in approximately 2 hours and 40 minutes.

For a more detailed description, please see Section 2.7 of the Supporting Material attachment.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of this project is to implement the Fresno to Bakersfield Section of the California HST System. For a more detailed description, please see Section 2.8 of the Supporting Material attachment.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The construction of the Fresno to Bakersfield Section of the California HST System would require the discharge of fill material to various waters of the United States. For a more detailed description, please see Section 3.1 of the Supporting Material attachment.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

Please see Section 3.2 of the attachment

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres Please see Section 3.3 including Table 3-4, Acres of Impacts Based on the LEDPA by Aquatic Resource Type,
or
Linear Feet of the Supporting Materials attachment.

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Please see Section 4.1 of the Supporting Materials attachment.

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24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- Please see Appendix 1 APN List of the Supporting Materials attachment.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
See attachment					
Section 5.2					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE

Kevin Melancophy 1/24/2014
SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

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Appendices to Attachment 1

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Figures

Acronyms

APN	Assessor Parcel Number
Authority	California High-Speed Rail Authority
CDFW	California Department of Fish and Wildlife
CIP	Cast-in-place
CMMP	Comprehensive Mitigation and Monitoring Plan
CP	Construction Package
FEIR/FEIS	Final Environmental Impact Report/Final Environmental Impact Statement
EPA	Environmental Protection Agency
ERA	environmentally restricted areas
FB	Fresno to Bakersfield
FRA	Federal Railroad Administration
HMF	Heavy Maintenance Facility
HST	High-Speed Train
LEDPA	Least Environmentally Damaging Practicable Alternative
PP1	Permitting Phase 1
SR	State Route
SWRCB	State (of California) Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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Attachment 1
Supporting Material

Chapter 1
Introduction

1.0 Introduction

The organization of this document follows the format of the ENG FORM 4345 Application for Department of the Army Permit. The following chapters present additional documentation for specific blocks on the application form:

- Chapter 1 – Introduction
- Chapter 2 – Name, Location and Description of Project
  - Block 12: Project Name or Title
  - Block 13: Names of Waterbodies
  - Block 14: Project Street Address
  - Block 15: Location of Project
  - Block 16: Other Location Descriptions
  - Block 17: Directions to the Site
  - Block 18: Nature of Activity
  - Block 19: Project Purpose
- Chapter 3 – Project Impacts
  - Block 20: Reason(s) for Discharge
  - Block 21: Types of Material Being Discharged and Amount of Each Type
  - Block 22: Surface Area of Wetlands or Other Waters of the United States Filled
- Chapter 4 – Mitigation Measures
  - Block 23: Description of Avoidance, Minimization, and Compensation
- Chapter 5 –Other Permitting Information
  - Block 25: Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Waterbody
  - Block 26: List of Other Certifications or Approvals/Denials Received from Other Federal, State, or Local Agencies for Work Described in This Application
- Chapter 6 – References

No additional documentation is required for the other blocks in this application. All descriptions herein focus on those activities with a potential to discharge fill material to waters of the United States, including wetlands.

Appendices to Attachment 1

1 APN List
2 Project Description
3 USACE Preliminary Jurisdictional Determination and Verification Letter
4 Project Impact Mapbook
5 Section 404 Impact Table
6 Pre- and Post-Construction Best Management Practices
7 Draft Compensatory Mitigation Plan (CD-ROM only)

Other Materials Provided (CD-ROM only)

USACE Concurrence Letters for Checkpoints A, B, and C

USFWS-Issued Biological Opinion on the California High-Speed Train System: Fresno to Bakersfield Section Project, Fresno, Tulare, Kings, and Kern Counties (No. 08WSMF00-2012-F-0247); issued February 28, 2013

Chapter 2

Name, Location and Description of Project

2.0 Name, Location and Description of Project

The California High Speed Rail Authority (Authority) and Federal Railroad Administration (FRA) are submitting this Section 404 Individual Permit application to the U.S. Army Corps of Engineers (USACE) for Permitting Phase 1 (PP1) of the Fresno to Bakersfield (FB) Section of the California High-Speed Train (HST) Project. The northern extent of PP1 of the FB Section of the HST project begins south of State Route (SR) 41 adjacent to Monterey Street in Fresno (Latitude 36°43'25.66"N, Longitude 119°47'3.50"W) and terminates in the unincorporated community of Crome at the intersection of 7th Standard Road and SR 43 (Central Valley Highway) (Latitude 35°26’29.89"N, Longitude 119°11’55.68"W) (Figure 2-1).

The FRA is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and other federal laws for this project. The Authority is serving as the joint-lead agency under NEPA and is the lead agency for compliance under the California Environmental Quality Act (CEQA). The FRA and the Authority are coordinating with U.S. Environmental Protection Agency (EPA) and USACE under the December 2010 *NEPA/ Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* (NEPA/404 MOU, 2010). The NEPA /404 MOU establishes “Checkpoint C” as a decision point in the early coordination process where signatory agencies concur or agree with the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) (as defined in the Clean Water Act 404(b)(1) Guidelines), and the Draft Compensatory Mitigation Plan.

The USACE and EPA concurred and agreed with, respectively, the preliminary LEDPA and Draft Compensatory Mitigation Plan on December 19, 2013. Consistent with PP1 as described in this application, the preliminary LEDPA and Draft Compensatory Mitigation Plan proposed in the November 2013 “Checkpoint C” package includes the portion of the Fresno to Bakersfield Section extending from the City of Fresno to 7th Standard Road in Kern County south of the City of Shafter. The preliminary LEDPA extending from 7th Standard Road to the City of Bakersfield will be identified at a later date.

The construction footprint of PP1 will include all of the HST right-of-way and associated facilities such as, traction-power substations and switching and paralleling stations, as well as the shifts in roadway rights-of-way, overcrossings, undercrossings, and interchanges that would be modified to accommodate the Fresno to Bakersfield Section of the HST project. These project elements are described in Chapter 2 of the Final EIR/EIS and below. Regulatory permit applications for Sections 404 and 401 of the Clean Water Act and Sections 2081 and 1602 of the California Fish and Game Code will be limited to PP1 of the Fresno to Bakersfield Section. This chapter provides general project information about the location of PP1, including names of waterbodies, approximate street addresses of its endpoints, and directions to the site.

2.1 Block 12: Project Name or Title

The Authority is requesting a Section 404 permit for PP1 of the FB Section of the HST project.

2.2 Block 13: Names of Waterbodies

PP1 of the FB Section of the HST project is within the Tulare Lake Basin. Prior to development, Tulare Lake was fed by several tributaries, but extensive urban and agricultural development modified the natural hydrology to a point where these streams generally no longer reach the former lake bed.

The major waterbodies within the PP1 area, all of which are part of the larger Tulare Lake Basin system, include:

- Kings River
- Cross Creek
- Tule River
- Deer Creek
- Poso Creek

PP1 crosses each of these rivers and creeks, as well as crossing many canals/ditches and retention/detention basins constructed to transport or store water for municipal or agricultural uses. In addition, PP1 crosses wetland habitats, including seasonal wetlands, and vernal pools. Seasonal wetland and vernal pool complexes can be observed near the Pixley National Wildlife Refuge, the town of Allensworth, and the Allensworth Ecological Reserve. These waterbodies and their impacted acreages are itemized and discussed in Chapter 3.

2.3 Block 14: Street Address

No street address is associated with PP1 of the FB Section of the HST project. In the north, the terminus of PP1 is south of the Fresno HST Station, where SR 41 and Monterey Street intersect with H Street. This location is approximately the 200 block of H Street.

In the south, the terminus of PP1 is at the intersection of 7th Standard Road and SR 43 in the unincorporated community of Crome in Kern County.

2.4 Block 15: Location of Project

As shown on Figure 2-1, PP1 extends 99.6 miles from the City of Fresno (Fresno County) through portions of Fresno, Kings, Tulare, and Kern counties. For most of this length, the alignment lies adjacent to either the existing BNSF railway or State Route (SR) 43.

The northern terminus of PP1 is in the City of Fresno south of State Route (SR) 41 adjacent to Monterey Street. The latitude and longitude coordinates (WGS 84) of the northern terminus are 35°26’29.89"N and 119°11’55.68"W.

The southern terminus of PP1 is at the intersection of 7th Standard Road and SR 43 in the vicinity of the unincorporated community of Crome in Kern County. The latitude and longitude coordinates (WGS 84) of the southern terminus are 35°44’16.35"N and 119°19’88.06"W.

2.5 Block 16: Other Location Descriptions

As described above, PP1 is approximately 100 miles long, and its footprint covers a total of approximately 8.06 square miles (or almost 5,161 acres). The municipalities in or near the PP1 footprint are the cities of Fresno, Hanford, Corcoran, Wasco, and Shafter. The unincorporated communities in or near the footprint are Oleander and Conejo in Fresno County; Ponderosa in Kings County; Allensworth in Tulare County; and Crome in Kern County.

Table 2-1 presents the sections, townships, and ranges covered by PP1’s footprint. A list of all Assessor Parcel Numbers (APN) impacted by PP1 are listed in Appendix 1.

PP1’s northern terminus is in the Fresno South USGS 7.5 minute topographic quadrangle (topo quad), and its southern terminus is in the Rosedale topo quad. Between these two points, PP1 would pass through the following topo quads: Allensworth, Alpaugh, Burris Park, Caruthers, Conejo, Corcoran, Laton, Malaga, Pond, Remnoy, Rio Bravo, Rosedale, Taylor Weir, Wasco, Wasco Northwest, and Waukena.

Table 2-1
Sections, Townships, and Ranges in PP1*

Township and Range	Section	Township and Range	Section	Township and Range	Section	Township and Range	Section
14S 20E	10	17S 22E (continued)	32	22S 23E (continued)	16	26S 24E (continued)	13
	14		33		17		24
	15	18S 22E	4		21		25
	23		9		22		36
	25		16		27	26S 25E	31
	26		21		28	27S 24E	1
	35		28		34		12
	36		29		35		13
15S 20E	1		33	23S 23E	2		24
	2	19S 22E	4		11		25
	11		9		12	27S 25E	6
	12		16		13		7
	13		21		23		18
	14		28		24		19
	23		32		26		30
	24		33	23S 24E	18		31
	25	20S 22E	5		19		32
	26		6		30	28S 25E	4
	36		7		31		5
16S 20E	1		8	24S 24E	6		8
	12		17		7		9
	13		20		8		10
16S 21E	6		28		9		14
	7		29		16		15
	18		33		17		23
	19		34		20		24
	29	21S 22E	2		29		25
	30		3		32		26
	32		4	25S 24E	4		36
	33		10		5	28S 26E	19
	34		11		8		30
17S 21E	2		12		9		31
	3		13		15		32
	4		14		16	29S 26E	4
	10		24		21		5
	11	21S 23E	18		22		9
	12		19		26		10
	13		30		27		11
17S 22E	7		31		35		14
	18	22S 23E	5		36		15
	20		6	26S 24E	1		
	28		8		2		
	29		9		12		

*Mount Diablo Meridian

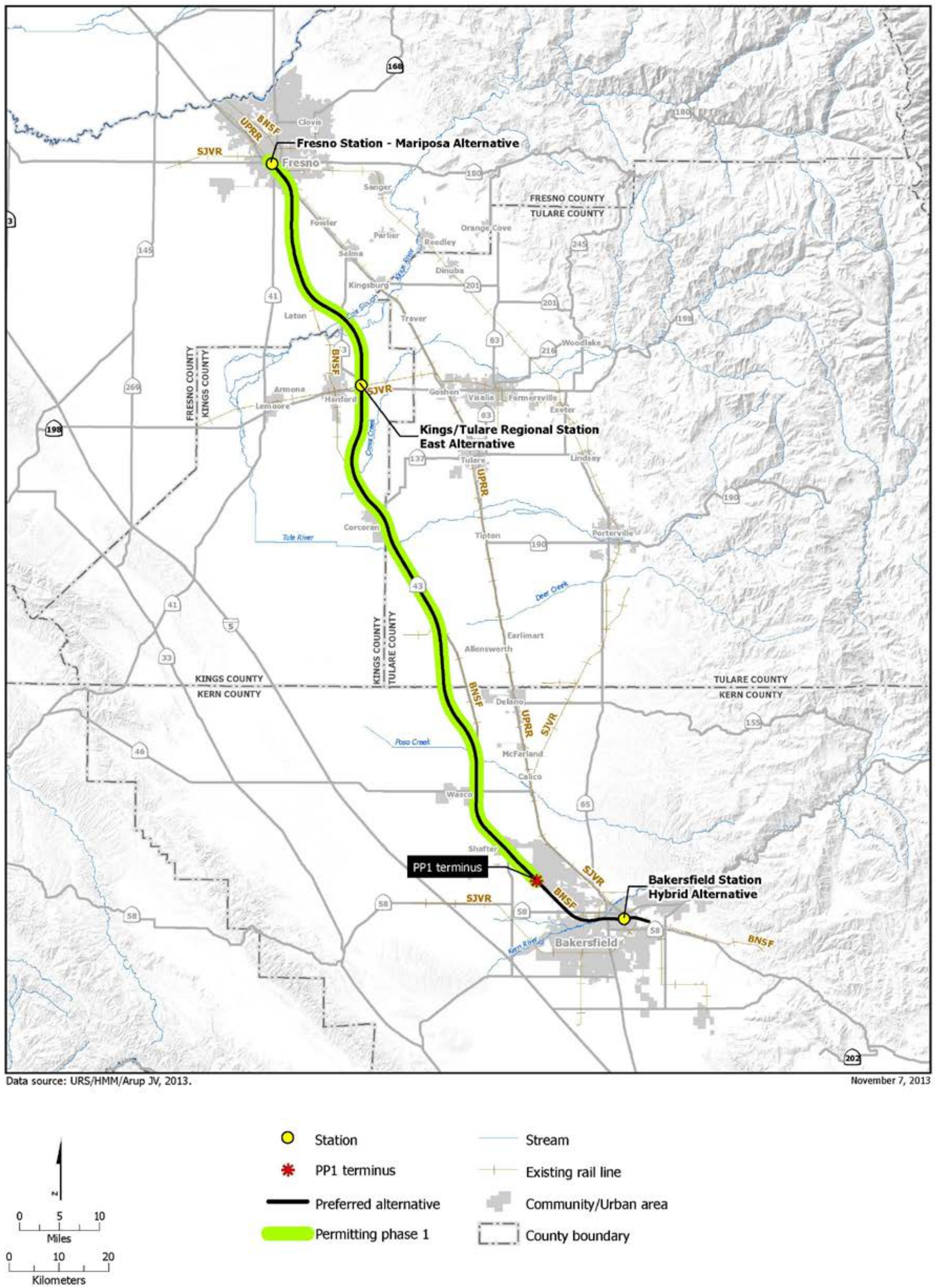

Figure 2-1
PP1 Location

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2.6 Block 17: Directions to the Site

To reach PP1's northern terminus in Fresno: from any of the USACE offices in Sacramento, head south on any of the numbered streets to X Street. Turn left (east) on X Street, and then enter Interstate 80 via the on-ramp there. Take Interstate 80 to SR 99. Follow SR 99 south for 166 miles to downtown Fresno. Take exit 132B toward Fresno Street/Civic Center. Turn left at Fresno Street. Turn Right at H Street.

To reach PP1's southern terminus near Crome, Kern County, continue south on SR 99 for 100 miles. Take the 7th Standard Road exit and travel west towards Merle Haggard Drive along 7th Standard Road. Continue along 7th Standard Road for 6.5 miles until the intersection of 7th Standard Road and Santa Fe Highway.

2.7 Block 18: Nature of Activity

The project description that follows is a summary of the project description provided in the Final Environmental Impact Report/ Final Environmental Impact Statement (FEIR/FEIS); and includes aspects of PP1 that are most relevant for describing potential effects on jurisdictional wetlands and other waters of the United States. A more detailed project description can be found in Appendix 2.

As one of the 10 sections identified in the Statewide Programmatic EIR/EIS (Authority and Federal Railroad Administration (FRA) 2005), the Fresno to Bakersfield Section is in the San Joaquin Valley. The HST System includes the HST tracks, structures, stations, traction power substations, maintenance facilities, and train vehicles. The HST would use four different track types. These track types have varying profiles: low, near-the-ground tracks are at grade, higher tracks can be elevated by either a structure or on a retained fill platform, and below-grade tracks are in a retained cut. The types of bridges that might be built include full channel spans, large box culverts, or, for some larger river crossings, piers within the ordinary high-water channel (refer to Attachment 2 – Engineering Design Plans). The track structure would consist of either a direct fixation system (with track, rail fasteners, and slab), or ballasted track, depending on local conditions.

The alignment for PP1 traverses the urban downtown area of the City of Fresno and moves south into rural Fresno, Kings, Tulare, and Kern Counties. Approximately 17 miles of track would be in Fresno County. Nearly all of the alignment would be at-grade. The alignment would be at-grade with bridges where it crosses Cole Slough and the Kings River Complex into Kings County, to the east of Laton. About 30 miles of PP1 would be in Kings County. A total of 5.5 miles of track would be elevated over the San Joaquin Valley Railroad and SR 198, Cross Creek, and portions of the BNSF Railroad right-of-way.

PP1 crosses approximately 25 miles of Tulare County. The majority of the alignment through Tulare County would be at-grade, with only a combined total of 2 miles elevated where the alignment crosses the Tule River, the Alpaugh railroad spur from the BNSF Railway, and Deer Creek. PP1 would cross about 30 miles of Kern County. Within this portion of the alignment, approximately 27 miles would be at-grade, while the remainder of the alignment would be elevated.

PP1 is designed to follow the existing BNSF Railway corridor as closely as practicable, except where bypasses were developed to avoid and minimize impacts on aquatic resources and other preservation features, and where minor deviations were necessary to accommodate design requirements. The design features evaluated as part of this application are summarized in Table 2-2.

Table 2-2
Design Features of PP1

Design Option	Preferred Alternative
Total length (linear miles)	100
At-grade profile (linear miles)	82
Elevated profile (linear miles)	16
Below-grade profile (linear miles)	1
Number of Straddle Bents	0
Number of Railroad Crossings	7
Number of **Major Water Crossings	7
Number of Road Crossings	136
Number of Roadway Closures	44
Number of Roadway Overcrossings and Undercrossings	43
*Note: Totals may not add up due to rounding. **Does not identify the total number of crossings over jurisdictional features	

The proposed project has features that will require a 404 permit from the USACE. Those features include the need for fill material within the jurisdictional waters of the U.S. to support the construction of at-grade railway tracks and associated infrastructure and facilities, and fill is also required for the construction of elevated railway tracks, which include piers and retaining walls. . Crossings over seven major water courses are proposed.

Before the proposed crossings are built, geotechnical investigations will be conducted. Geotechnical sampling would be a temporary impact limited to 100 linear feet of the waterways within the existing construction footprint identified for the respective crossing. The geotechnical sampling will generate fill as needed to gather data for construction of the piles that will support elevated structures/guideways that span the jurisdictional waters.

Proposed Crossing Approaches for PP1

This subsection describes the proposed construction approach to crossing existing water features within PP1. Water features (total number of features indicated in parentheses for each category) to be crossed include the following:

- River and creek crossings (7)
- Other constructed watercourses such as ditches and canals (120)
- Depressional aquatic features, including vernal pools, emergent wetlands, and seasonal wetlands (50)
- Constructed retention/detention basins and reservoirs (47)

The proposed river and creek crossings (Kings River, Cross Creek, Tule River, Deer Creek, and Poso Creek) would be accomplished by constructing elevated truss superstructures over them. The elevated structures or guideways that cross these rivers and creeks are anticipated to be

supported by either a cast-in-drilled-hole (CIDH) pile or a reinforced concrete pile footing. After completion, each concrete pile is anticipated to have a permanent impact of less than 0.05 acre. The precast span-by-span segmental method is the proposed method to build the concrete bridge spans associated with elevated sections.

The construction of the aerial structures is proposed to begin in fall 2014, with in-stream work occurring from June 1 to October 15. Construction is anticipated to take approximately four construction seasons, including two seasons of near-water or, at times, in-water work (depending on flow) and an additional two seasons for construction of upland piers and bridge decks. Staging areas for construction equipment will be outside sensitive biological resources, including habitat for special-status species, habitats of concern (e.g., waters of the U.S. wetlands, riparian communities), and wildlife movement corridors, to the maximum extent possible (for details refer to Appendix 2).

A total of 120 additional canals and ditches will be crossed using precast concrete box culverts, with the number of cells or openings being dependent on the hydrology. Some culverts may be cast in place as determined appropriate by the construction contractor. Culverts will be sized to pass maximum canal/drain flows at all crossing locations.

In areas where the HST guideway needs support, such as approaches to highway crossings or major stream features, depressional aquatic features (vernal pools, seasonal wetlands, and open water pools; 50 total features) will be permanently impacted by fill placed within the features as needed to support the HST guideway. Fill within depressional features will be limited to that portion required to support the trackway and culverts installed, where necessary.

The approach for crossings of constructed basins (47 total features) will be similar in nature to the approach used to cross depressional aquatic features. Fill will be placed in basins as necessary to support the guideway, and will be limited to the amount required. Culverts will be installed where they are needed. Depending on the extent of the impact, basins would be modified, improved, or replaced as needed onsite to maintain existing drainage and hydrologic functions, and to support HST drainage requirements.

2.8 Block 19: Project Purpose

The purposes of this project are:

- To implement the Fresno to Bakersfield Section of the California HST System.,
- To provide the public with electric-powered high-speed rail service that provides predictable and consistent travel times between major urban centers and connectivity to airports, mass transit systems, and the highway network in the southern San Joaquin Valley.
- To connect the northern and southern portions of the system.

The Authority and FRA propose to construct and operate a rail line to support an intercity HST system. The California HST System will eventually connect San Francisco and Los Angeles and encompass 800 miles, including extensions to Sacramento and San Diego. The HST System is envisioned as an electrically powered, high-speed, steel-wheel-on-steel-rail technology with state-of-the-art safety, signaling, and automated train-control systems. The trains will be capable of operating at speeds of up to 220 miles per hour over a fully grade-separated, dedicated track alignment. The final project will consist of nine separate sections (including the Fresno to Bakersfield Section) that can function independently, but which, joined together, will create a large, statewide HST system.

Construction Package (CP) 1C of PP1 is planned to commence in fall 2014 and will include the area from just south of the Fresno Station to East American Avenue in Fresno. CP 2/3 is

scheduled for construction in the spring of 2015, and the schedule for CP 4 is being developed (see Section 3.0 for description of each CP). The Authority is seeking agency approvals for this initial construction and operation of PP1. To maintain its eligibility for federal American Recovery and Reinvestment Act funding, the Authority intends to complete construction by September 2017.

Chapter 3
Project Impacts

3.0 Project Impacts

This chapter explains discharges to wetlands and other waters of the United States; describes material types of each type of fill; and presents the locations and areas of the fill that would be permanently discharged. The volume of fill has been calculated for PP1 impacts using a standard depth per wetland or water feature type, which is multiplied by the area or width of mapped aquatic resource. Discharge estimates are a maximum quantity that will not be exceeded to provide permitting agencies assurances on the maximum quantity (acres) reported and permitted. This chapter also presents similar types of information about the temporary disturbances or other related impacts on these aquatic resources.

FRA and Authority intend to obtain permits for all of PP1. For purposes of the numerous contracts necessary to construct the HST project, PP1 has been sub-divided into multiple Construction Packages (CPs). The direct permanent and temporary impacts to jurisdictional resources are represented for each CP within PP1 in Tables 3-4a, 3-4b, and 3-4c. Descriptions of CP1C, CP 2/3, and CP 4 are as follows.

- CP1C is the portion of CP 1 that occurs from just south of the Fresno Station to East American Avenue. Located completely within the metropolitan Fresno area, it is approximately 5 miles long.
- CP 2/3 extends from East American Avenue to 1 mile north of the Tulare/Kern County Line. This construction package crosses Fresno, Kings, and Tulare Counties and is about 63 miles long.
- CP 4 is the final construction package in PP1. The limits of CP 4 are from the end of CP 2/3 to 7th Standard Road. The southern terminus of PP1 and CP 4 coincide at 7th Standard Road. It is about 32 miles long.

The *Preliminary Jurisdictional Waters and Wetlands Delineation Report* (Authority and FRA 2011), describes the methods used to identify jurisdictional wetlands and other waters of the United States in the project area. Separate sections therein contain descriptions of wetlands and other waters of the United States in the study area surrounding the actual impacts. All aquatic surface water features are assumed jurisdictional under Section 404 of the Clean Water Act using the Preliminary Jurisdictional Determination approach defined in Regulatory Guidance Letter 08-02 (USACE 2008). After publication of the Revised DEIR/Supplemental DEIS in 2012, the Authority and USACE continued to coordinate regarding the delineation of wetlands and waters of the United States in the Wetland Study Area. During this period, the extent and classification of a number of wetlands and waters of the United States were revised, and in some instances new features were added. On February 5, 2013 the USACE issued a Preliminary Jurisdictional Determination, which incorporated these changes, concurred with the measured areas, and identified locations of wetlands and other waters of the United States (Appendix 3). Updates to the Preliminary Jurisdictional Determination will be provided to the USACE for review and approval.

Jurisdictional features include canals and ditches, emergent wetlands, reservoirs, retention/detention basins, seasonal riverine, seasonal wetlands, vernal pools, and vernal swales.

In accordance with USACE requirements for Section 404 permit applications, maps of the PP1 impacts are presented at 1:200 scale. In this map series, Appendix 4 (Index Sheets 2-14) are index maps of the entire set of the proposed preferred alignment with highlights and callouts for those individual map sheets that show impacts on wetlands or other waters of the U.S. Those wetland-impact figures are presented at the 1:200 scale and are numbered as individual sheets in Appendix 4.

The following sections present supporting material for Blocks 20 through 22 of the ENG 4345 form. They contain Tables 3-1 through 3-6, which provide information specific to each block.

3.1 Block 20: Reason(s) for discharge

The construction of PP1 would require the discharge of fill material to various waters of the U.S., including potentially jurisdictional wetlands and other waters of the U.S. The specific structures associated with each fill are further described under Section 3.2 and in Table 3-1, below. Measures were taken to avoid and minimize impacts on wetlands and waters of the United States through selection of the LEDPA. These measures include the incorporation of elevated structures over waterways and sensitive aquatic habitat. However, the discharge of fill material into various wetlands and waters of the U.S. will occur at-grade and with the structures associated with elevated tracks. The fill would largely be in the form of concrete structures, gravel, soils, or aggregate rock. This fill would be used in the construction of at-grade rail beds, elevated tracks or bridged rails, road overcrossings, and other project facilities.

The estimated total area of fill in waters of the U.S. for the entire footprint under consideration for PP1 is 96.54 acres. The breakdown of this estimate is presented in the following sections. These impacts from fill would occur at approximately 225 locations along PP1.

3.2 Block 21: Type(s) of material being discharged and the amount of each type in cubic yards

PP1 includes approximately 225 locations where fill would be placed into wetlands or other waters of the U.S.

Table 3-1 shows the types and sources of fill materials that would be used in each project activity. This is a Design/Build project; the level of design contained within this application is sufficient to provide a descriptive overview regarding the amount of fill material. The fill material types shown in Table 3-1 would be discharged as a result of the alignments, associated stations, and other features included in the project description, including infrastructure components, power stations, and maintenance facilities.

Table 3-1
Fill Material Types

Project Activity	Type(s) of Fill	Fill Material(s) and Source(s)
Track Bed	Embankment	Structural backfill consisting of well-graded soils, gravels and stone compacted to a relative compaction of 95%; material will be obtained from a permitted commercial source if available.
	Ballast	Crushed stone, 0.75” to 2.5”; sources unknown at this time.
	Sub-ballast (“Blanket Layer”)	Coarse-grained material (such as full crushed graduate gravel) between the ballast and subgrade, with 50% of crushed stone; material will be obtained from a permitted commercial source if available.
	Subgrade	Structural backfill consisting of imported well-graded soils; material will be obtained from a permitted commercial source if available.

Table 3-1
Fill Material Types

Project Activity	Type(s) of Fill	Fill Material(s) and Source(s)
Track Bed (continued)	Geosynthetic Elements	Geotextiles (woven or non-woven), Geomembranes (synthetic or bituminous non-permeable by water), Geogrids (fine or coarse mesh); sourced from existing commercial sites.
	Pipe Culvert for Drainage	Reinforced Concrete Pipe precast using new materials sourced from existing commercial sites.
	Box Culvert for Drainage or Wildlife Crossings	Reinforced Concrete Box Culvert precast using new materials sourced from existing commercial sites.
	Structural Backfill of Culverts	Controlled low-strength material composed of workable mixture of aggregate, cementitious materials, water. Material will be obtained from a permitted commercial source if available.
	Sand Bedding of Culverts	Sand free of clay or organic material where 90% to 100% will pass through a No. 4 sieve, and no more than 5% will pass through a No. 200 sieve. Material will be obtained from a permitted commercial source if available.
Erosion Control	Hydrostatic Filter Concrete Revetment Mattress	Double-layered geofabric casing injected with a fine aggregate concrete infill. Material will be obtained from a permitted commercial source if available.
	Gabion Box or Mat	Pre-made steel wire mesh cage laced together on site and filled with rock forming a durable basket. Material will be obtained from a permitted commercial source if available.
Bridge or Overpass	Concrete Girder	Reinforced concrete from existing commercial sites. Precast or Cast-in-Place (CIP) depending on geotechnical results.
	Concrete Pile	Reinforced concrete from existing commercial sites. Precast or CIP depending on geotechnical results.
	Concrete Foundation	Reinforced concrete from existing commercial sites. Precast or CIP depending on geotechnical results.
	Steel Rebar	Steel from existing commercial sites.
	Wall Backfill for CIP	Mechanically Stabilized Earth and drainage aggregate. Material will be obtained from a permitted commercial source if available.

The volumes of fill for each feature are estimated by multiplying the GIS-derived area of each impact by a standard assumption of the depth of each type of aquatic resource. Table 3-2 shows the assumed depths that may be used to make these volume estimations. This approach is used due to the early level of design complete at the time this permit application was prepared and because the large number of individual features prohibits an individual assessment of each feature’s depth. Table 3-3 summarizes the estimated volume of fill material needed by each type of aquatic resource.

The *Preliminary Jurisdictional Waters and Wetlands Delineation Report* (Authority and FRA 2011) presents the results of the on-site delineations of wetlands and other waters of the U.S. In

combination with the GIS layers representing the locations of permanent and temporary project activities, this enabled an estimation of the spatial extent of the impacts on each type of water. A Project Impact Mapbook showing the location of the aquatic features overlaid with the project footprint is included as Appendix 4. From these results of the wetland delineation, summations were made by impact type, by type of water, by CP, and by jurisdictional status. These summed results were presented in the preceding tables in this section. These results are provided for completeness.

Table 3-2
Assumed Depth of Fill, by Aquatic Resource Type

Aquatic Resource	Depth (feet)
Canals and Ditches	8
Emergent Wetland	1
Reservoir	12
Retention/Detention basin	10
Seasonal riverine	2
Seasonal wetland	1
Vernal pool	0.5
Vernal swale	0.5

Table 3-3
Summary Table of Volume of Fill by Aquatic Resource Type

Aquatic Resource	Surface Area (acres)	Surface Area (square feet)	Volume (cubic yards)
Canals and Ditches	52.89	2,304,066	682,686
Retention/Detention basin	34.37	1,497,001	554,445
Emergent Wetland	0.01	551	20
Seasonal riverine	2.08	90,752	6,722
Seasonal wetland	1.57	68,312	2,530
Vernal pools and swales	5.63	245,331	4,543

3.3 Block 22: Surface Area in Acres of Wetlands or Other Waters Filled

PP1 includes approximately 225 locations where fill would be discharged to wetlands or other waters of the U.S. Tables 3-4a, 3-4b, and 3-4c summarize the area (in acres) of permanent fill that would be discharged to each type of wetland or other waters of the United States as specified in each construction package. Table 3-5 summarizes the total area (in acres) of

permanent fill that would be discharged to each type of wetland or other waters of the United States within the entire PP1. Table 3-6 summarizes those impacts by each of the watersheds in the study area. A detailed table of the impacts by feature is provided in Appendix 5, Section 404 Impact Table.

3.3.1 Impact Analysis

Potential impacts on wetlands and other waters of the U.S. were quantified by overlaying the construction footprint and wetland study area boundary over delineated jurisdictional features. All aquatic surface water features are assumed jurisdictional under the Preliminary Jurisdictional Determination.

Figures 3-1 and 3-4 show a plan-view schematic of a stylized HST at-grade and elevated project and construction footprint. The light blue areas on Figures 3-1 and 3-4 show the temporary work areas. Temporary work areas include certain portions of elevated alignment right-of-way and acquired properties that will not house permanent structures or facilities. Figures 3-2 and 3-5 show how waters of the U.S. were delineated for at-grade and elevated project and construction footprint. Figures 3-3 and 3-6 show how impacts on waters of the U.S. were quantified. The direct impact calculation methodology described below and illustrated in Figures 3-3 through 3-6 was used to calculate the impacts.

For purposes of evaluating impacts on jurisdictional waters, the area of potential impact generally consists of the following areas:

- A 60- to 120-foot construction footprint for track segments; and,
- The project footprint for any project-related facilities or improvements (e.g., the Fresno to Bakersfield Section HST stations, power distribution facilities, water crossings, and/or maintenance facilities).

To determine the potential maximum direct impact, all aquatic resources within the project footprint (at-grade track or associated facilities) would be considered directly and permanently impacted by the construction of such facilities, with notable differences in how impacts are calculated between at-grade and elevated segments of the track alignment, as follows:

- For at-grade segments of the track alignment, all aquatic resources present within the project footprint would be considered directly and permanently impacted by the introduction of compacted soil and ballast material and the construction of the track.

- For elevated segments of the track alignment:

  - All aquatic resources that receive fill from piers, abutments, or other structures in the construction footprint would be considered directly and permanently impacted.

  - All aquatic resources (excluding vernal pools) within the elevated construction footprint that are not filled would be considered directly and temporarily impacted. Any permanent impact to a portion of a vernal pool feature is considered to be a direct and permanent impact to the entire feature.

- Any vernal pool that is partially within the project footprint (at-grade track, elevated track, or project-related facilities) and within 250 feet of the project footprint (but is not subjected to fill) would be considered an indirect-bisect impact.

Table 3-4a
CP1C - Acres of Impacts Based on the LEDPA by Aquatic Resource Type

Type of Water	Aquatic Resource Type	Impact Type (acres)				
		Direct				Total Direct and Indirect Bisect
		Permanent	Temporary	Total	Indirect Bisect	
Wetlands	Emergent wetland	0.00	0.00	0.00		0.00
	Seasonal wetland	0.00	0.00	0.00		0.00
	Vernal pools and swales	0.00	0.00	0.00	0.00	0.00
Wetland subtotal		0.00	0.00	0.00	0.00	0.00
Other waters of the U.S.	Canals/Ditches	0.48	2.00	2.48		2.48
	Retention/detention basin	0.06	1.01	1.07		1.07
	Seasonal riverine	0.00	0.00	0.00		0.00
Other waters subtotal		0.54	3.01	3.55		3.55
Waters of the U.S. Total		0.54	3.01	3.55		3.55

Note: Impacts are conservatively estimated due to slight overlap in alignments.
Due to rounding, the sums of impacts may not match by 0.01 acre.
These numbers include the Kings/Tulare Regional Station.
* Indirect bisect impact acreages are areas where vernal pools or vernal swales are located partially within the indirect impact area. The unique characteristics of these features prohibit them from being partially impacted; therefore, if any portion of a vernal pool or vernal swale is impacted the entire feature is included in the impact amount

Table 3-4b
CP 2/3 - Acres of Impacts Based on the LEDPA by Aquatic Resource Type

Type of Water	Aquatic Resource Type	Impact Type (acres)				
		Direct			Indirect Bisect	Total Direct and Indirect Bisect
		Permanent	Temporary	Total		
Wetlands	Emergent wetland	0.01	0.00	0.01		0.01
	Seasonal wetland	1.56	1.09	2.65		2.65
	Vernal pools and swales	1.01	0.00	1.01	3.25	4.26
Wetland subtotal		2.59	1.09	3.67	3.25	6.93
Other waters of the U.S.	Canals/Ditches	51.27	8.07	59.35		59.35
	Retention/detention basin	30.62	11.51	42.13		42.13
	Seasonal riverine	2.08	0.46	2.54		2.54
Other waters subtotal		83.98	20.04	104.02		104.02
Waters of the U.S. Total		86.57	21.13	107.69	3.25	110.94

Note: Impacts are conservatively estimated due to slight overlap in alignments.
Due to rounding, the sums of impacts may not match by 0.01 acre.
These numbers include the Kings/Tulare Regional Station.
* Indirect bisect impact acreages are areas where vernal pools or vernal swales are located partially within the indirect impact area. The unique characteristics of these features prohibit them from being partially impacted; therefore, if any portion of a vernal pool or vernal swale is impacted the entire feature is included in the impact amount

Table 3-4c
CP 4 - Acres of Impacts Based on the LEDPA by Aquatic Resource Type

Type of Water	Aquatic Resource Type	Impact Type (acres)				
		Direct			Indirect Bisect	Total Direct and Indirect Bisect
		Permanent	Temporary	Total		
Wetlands	Emergent wetland	0.00	0.00	0.00		0.00
	Seasonal wetland	0.00	0.00	0.00		0.00
	Vernal pools and swales	4.62	0.00	4.62	8.28	12.90
Wetland subtotal		4.62	0.00	4.62	8.28	12.90
Other waters of the U.S.	Canals/Ditches	1.15	0.97	2.11		2.11
	Retention/detention basin	3.69	3.26	6.95		6.95
	Seasonal riverine	0.00	0.02	0.02		0.02
Other waters subtotal		4.83	4.25	9.08		9.08
Waters of the U.S. Total		9.46	4.25	13.71	8.28	21.99

Note: Impacts are conservatively estimated due to slight overlap in alignments.

Due to rounding, the sums of impacts may not match by 0.01 acre.

These numbers include the Kings/Tulare Regional Station.

* Indirect bisect impact acreages are areas where vernal pools or vernal swales are located partially within the indirect impact area. The unique characteristics of these features prohibit them from being partially impacted; therefore, if any portion of a vernal pool or vernal swale is impacted the entire feature is included in the impact amount

Table 3-5
PP1 - Acres of Impacts Based on the LEDPA by Aquatic Resource Type

		Impact Type (acres)				
		Direct				
Type of Water	**Aquatic Resource Type**	**Permanent**	**Temporary**	**Total**	**Indirect Bisect**	**Total Direct and Indirect Bisect**
Wetlands	Emergent wetland	0.01	0.00	0.01		0.01
	Seasonal wetland	1.57	1.09	2.65		2.65
	Vernal pools and swales	5.63	0.00	5.63	11.54	17.17
Wetland subtotal		7.21	1.09	8.29	11.54	19.82
Other waters of the U.S.	Canals/Ditches	52.89	11.04	63.93		63.93
	Retention/detention basin	34.37	15.78	50.15		50.15
	Seasonal riverine	2.08	0.48	2.57		2.57
Other waters subtotal		89.34	27.31	116.65		116.65
Waters of the U.S. Total		**96.55**	**28.39**	**124.94**	**11.54**	**136.48**

Note: Impacts are conservatively estimated due to slight overlap in alignments.

Due to rounding, the sums of impacts may not match by 0.01 acre.

These numbers include the Kings/Tulare Regional Station.

* Indirect bisect impact acreages are areas where vernal pools or vernal swales are located partially within the indirect impact area. The unique characteristics of these features prohibit them from being partially impacted; therefore, if any portion of a vernal pool or vernal swale is impacted the entire feature is included in the impact amount

Table 3-6
Acres of Impacts by HUC-8 Watershed

Watershed	Wetlands			Other Waters of the U.S.		Total Impacts to Waters of the U.S.
	Direct Permanent	Direct Temporary	Indirect Bisect	Direct Permanent	Direct Temporary	
Upper Dry	0.00	0.00	0.00	3.55	4.24	7.79
Upper Kaweah	0.00	0.00	0.00	7.34	11.42	18.76
Tulare-Buena Vista Lakes	1.14	0.34	0.00	42.98	4.85	49.31
Upper Tule	0.03	0.70	0.00	0.39	0.87	1.99
Upper Deer-Upper White	6.04	0.04	11.54	33.17	3.71	54.50
Upper Poso	0.00	0.00	0.00	1.92	2.22	4.14
Total	**7.21**	**1.08**	**11.54**	**89.35**	**27.31**	**136.49**
Due to rounding, the sums of impacts may not match by 0.01 acre.						

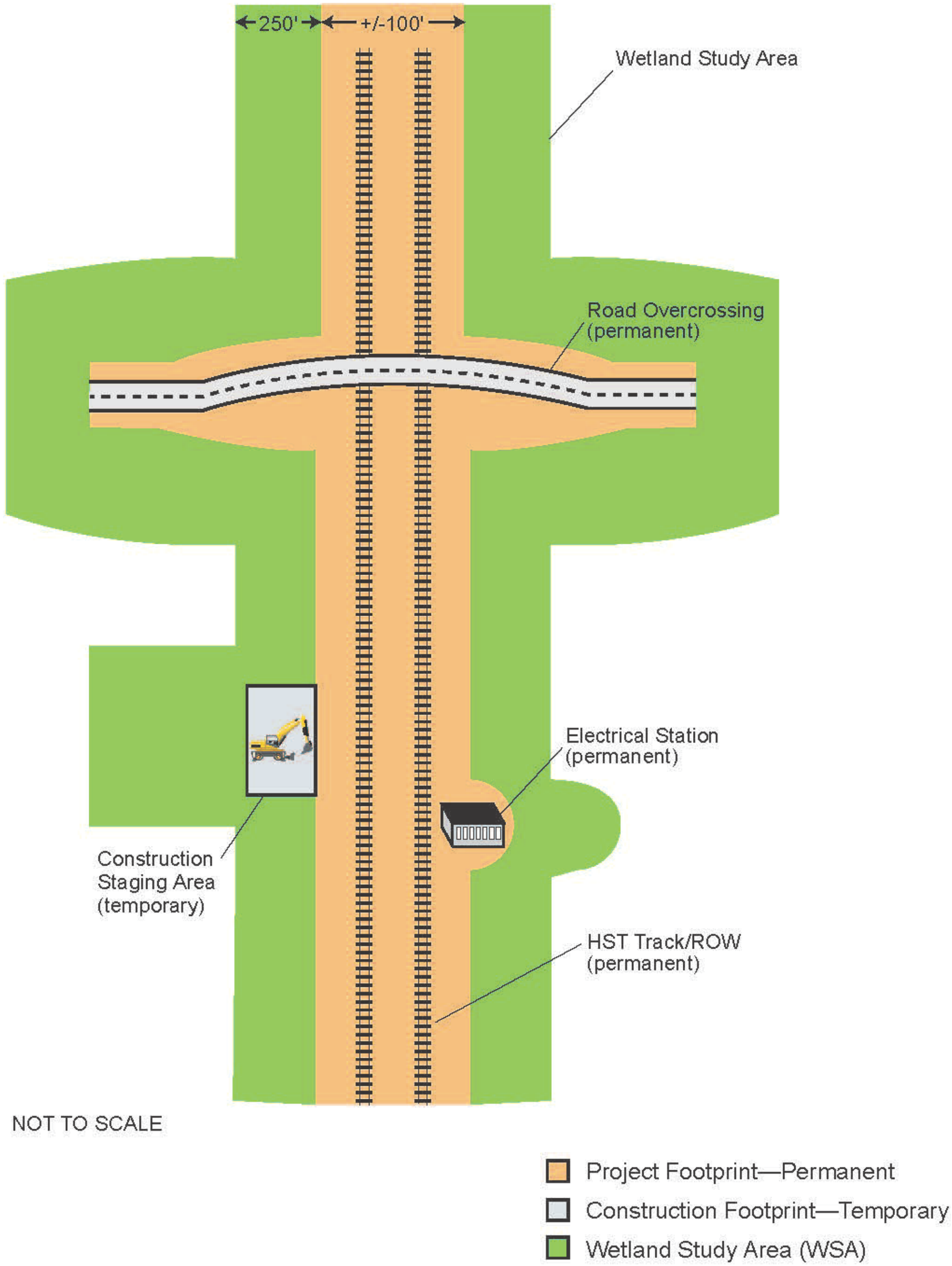

Figure 3-1
Project and Construction Footprint

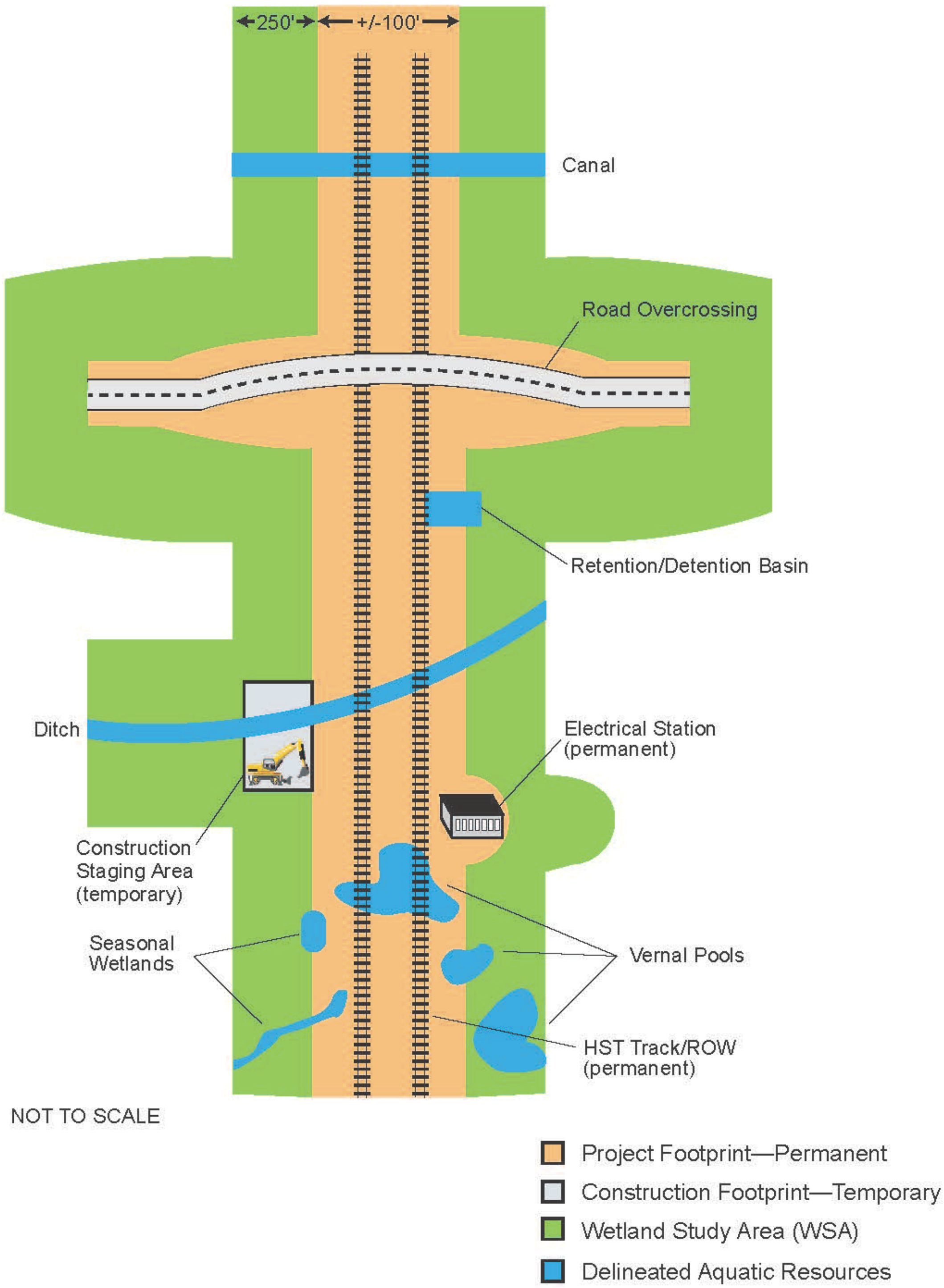

Figure 3-2
Wetland Delineation

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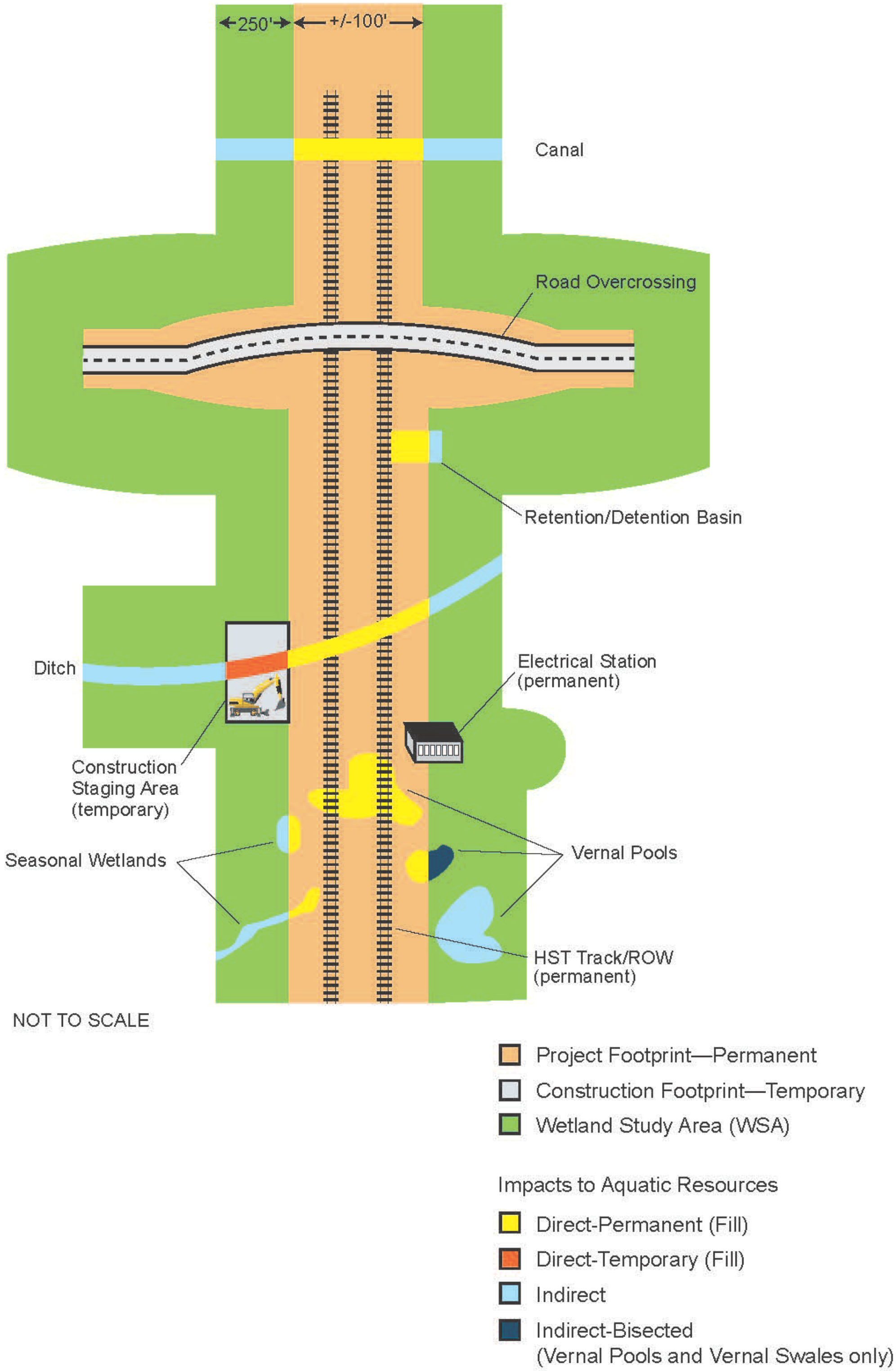

Figure 3-3
Construction and Project Impacts

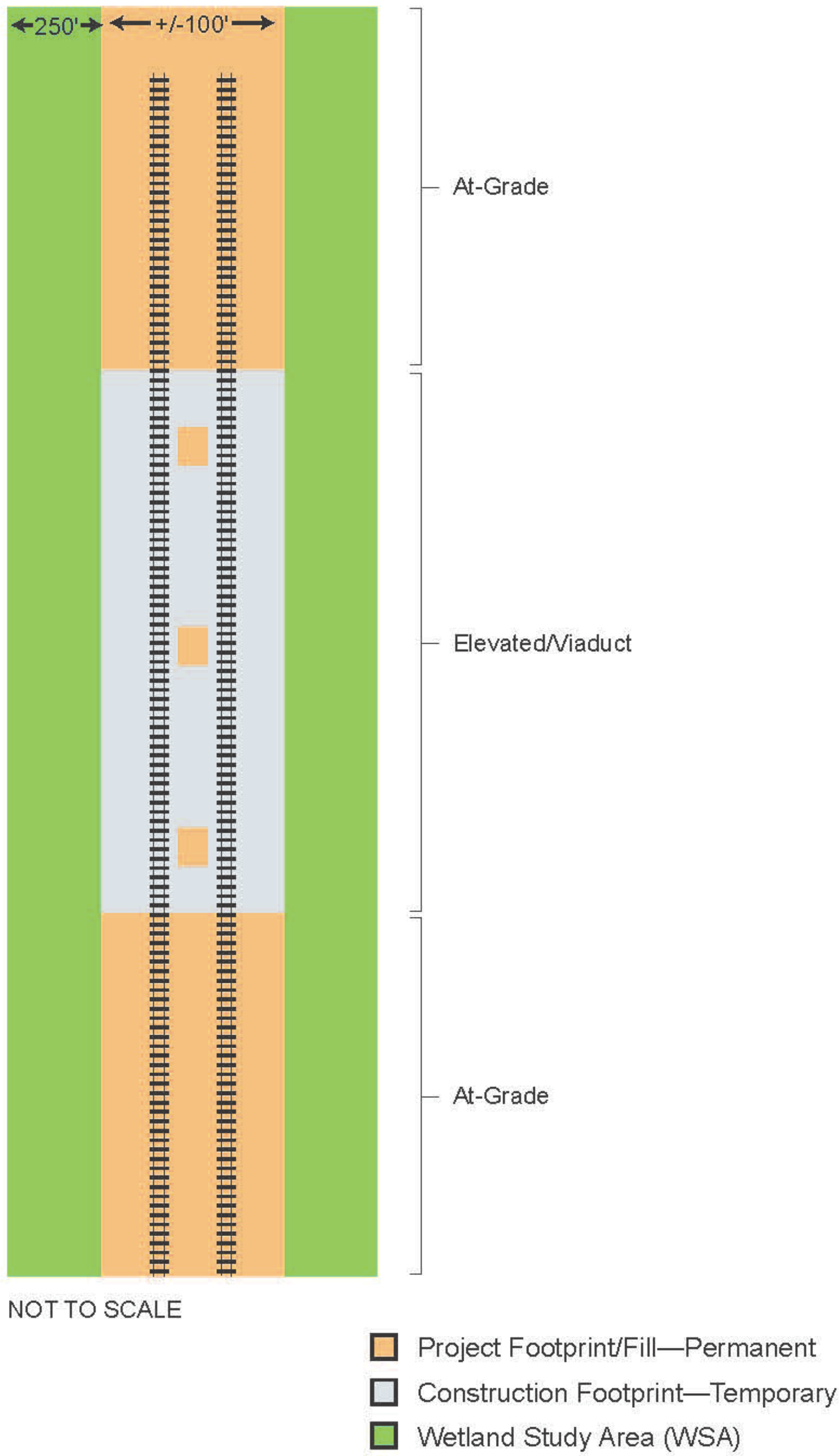

Figure 3-4
At-grade vs. Elevated

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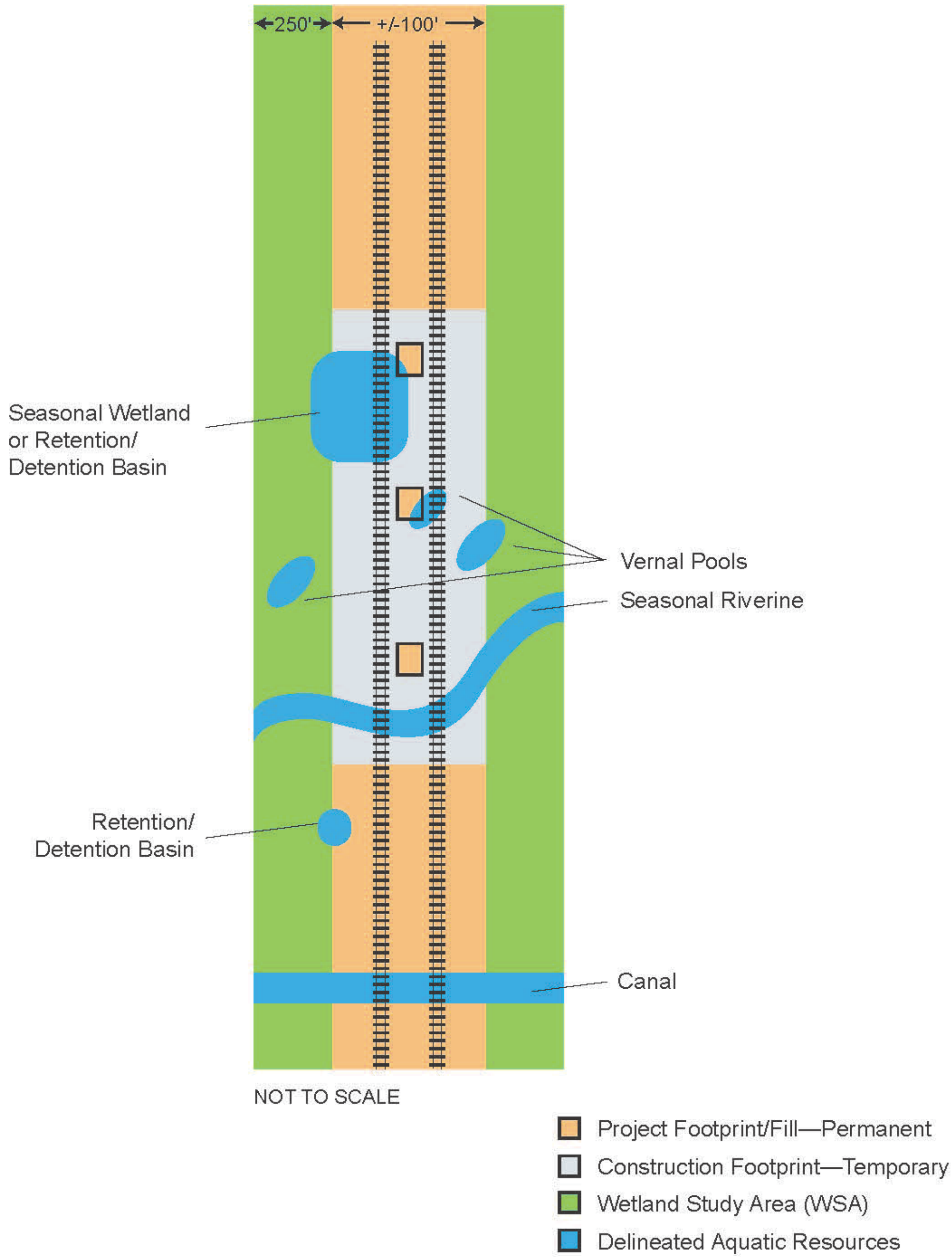

Figure 3-5
At-grade vs. Elevated Wetland Delineation

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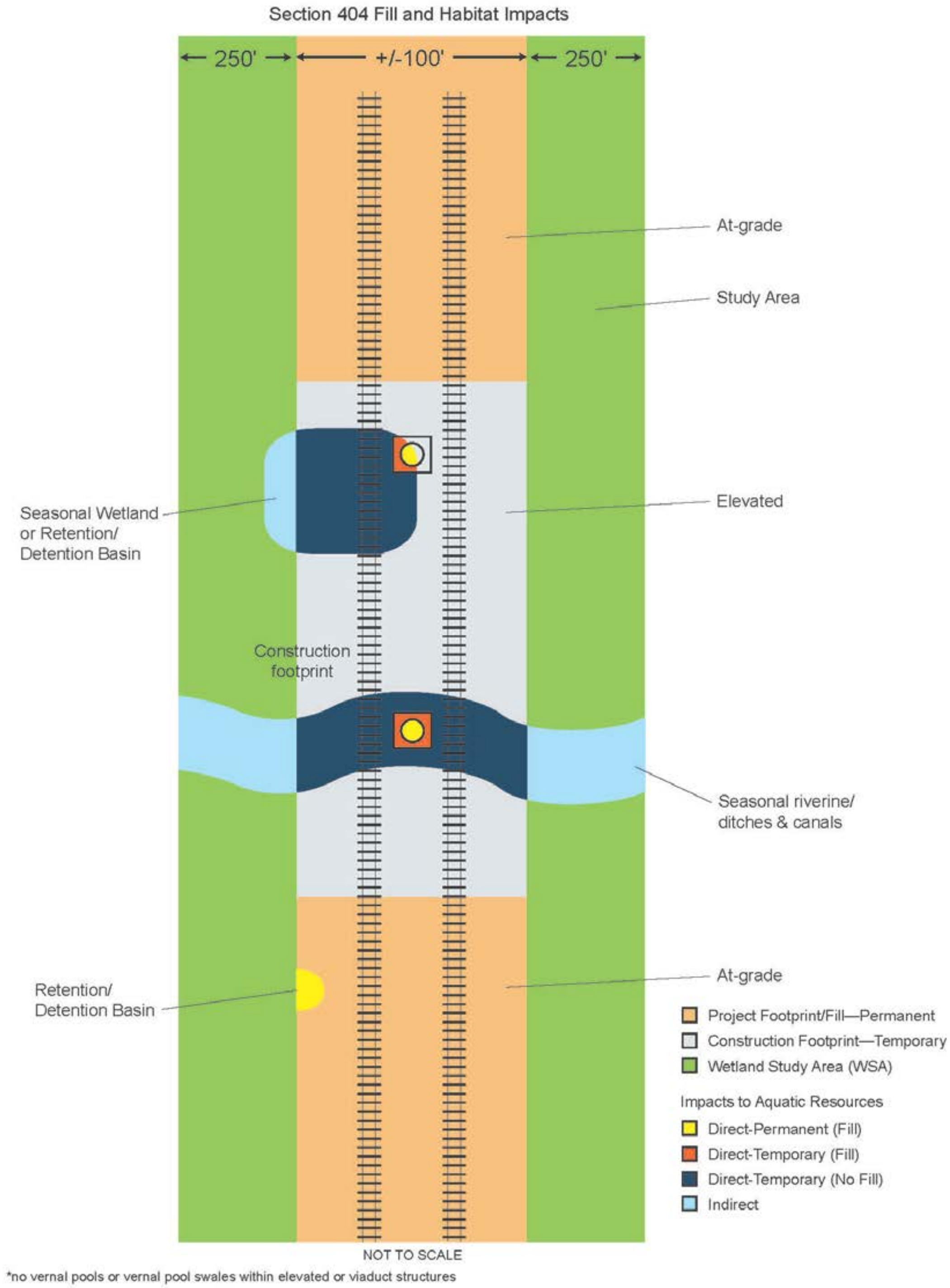

Figure 3-6
At-grade vs. Elevated Construction and Project Impacts

Chapter 4
Mitigation Measures

4.0 Mitigation Measures

This chapter provides an introduction to the mitigation measures associated with the project.

4.1 Block 23: Avoidance, Minimization, and Compensation

The proposed project will provide mitigation measures in compliance with all applicable federal and state laws and regulations. To comply with these laws, the project is proposing a range of strategies, Best Management Practices (BMPs), mitigation measures, and Compensatory Mitigation. These will address impacts to wetlands and other waters of the U.S., as well as effects on special-status species and other biological resources that may be affected by the project. The range of strategies, BMPs, mitigation measures, and compensatory mitigation to mitigate for impacts to these resources includes onsite avoidance and minimization measures, as well as offsite compensatory mitigation.

4.1.1 Strategies and BMPs

Strategies are based on the April 2008 Final Mitigation Rule developed by the USACE and the EPA to govern compensatory mitigation for authorized impacts on wetlands, streams, and other waters of the U.S. (40 CFR Sec 230.91). Those regulations are designed to improve the effectiveness of compensatory mitigation to replace lost aquatic resource functions and area, expand public participation in compensatory mitigation decision making, and increase the efficiency and predictability of the mitigation project review process. Please see Appendix 6 - Pre- and Post-Construction Best Management Practices for details on the BMPs.

Three major strategies have been selected to effectively mitigate for impacts on wetlands and other waters of the U.S. Those steps, which will be developed and described more fully before construction begins in aquatic systems, are as follows:

- Avoidance of impacts through selection of the Least Environmentally Damaging Practicable Alternative.
- Development of appropriate minimization strategies, including construction training and construction monitoring, as well as implementation of appropriate engineering controls, the Storm Water Pollution Prevention Plan, and appropriate dewatering techniques to reduce the effects on the aquatic system.
- Development and implementation of a compensatory mitigation plan. The plan is currently being worked on with agency coordination. The mitigation for the loss of aquatic resources would be commensurate with the impacts on wetlands and functions lost. In general, compensatory mitigation includes the restoration, enhancement, establishment and preservation of aquatic systems. The compensatory mitigation plan would detail how the project would offset the loss of wetland functions and services (values) through, in order of preference:
  - Purchase of USACE-approved wetland mitigation bank credits. To the maximum extent possible, permanent impacts on wetlands will be compensated for by purchase of wetland credits. This will occur at a minimum ratio of 1:1.
  - Contribute to an in-lieu fee program as approved by USACE and other regulatory agencies.
  - Develop a permittee-responsible mitigation site(s) under a watershed approach.
  - Develop permittee-responsible on-site and /or in-kind mitigation.

This strategy includes the on-site restoration and/or improvement of all temporarily disturbed wetlands and other waters within the project footprint.

4.1.2 Mitigation Measures

Mitigation measures from the Final EIR/EIS (Authority and FRA 2014) that minimize impacts to wetlands and other waters of the U.S. are listed below.

Bio-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). Before the start of ground-disturbing activities, the Project Biologist will verify that ESAs and ERAs are delineated on final construction plans (including grading and landscape plans) and in the field and will update as necessary. ESAs are areas within the construction zone, or on compensatory mitigation sites, containing suitable habitat for special-status species and habitats of concern that may allow construction activities but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are sensitive areas that are typically outside the construction footprint that must be protected in place during all construction activities.

Before and during the implementation of ground-disturbing activities, the Project Biologist, will mark ESAs and ERAs with high-visibility temporary fencing, flagging, or other agency-approved barriers to prevent encroachment of construction personnel and equipment. Sub-meter accurate Global Positioning System (GPS) equipment will be used to delineate all ESAs and ERAs. The Contractor will remove ESA and ERA fencing when construction is complete or when the resource has been cleared according to agency permit conditions in the MMRP and construction drawings and specifications. The Project Biologist will submit a memorandum regarding the field delineation and installation of all ESAs/ERAs to the Mitigation Manager.

Bio-MM#9. Equipment Staging Areas. Before the start of ground-disturbing activities, the Project Biologist will confirm that staging areas for construction equipment are outside areas of sensitive biological resources, including habitat for special-status species, habitats of concern, and wildlife movement corridors, to the extent feasible. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#19. Seasonal Vernal Pool Work Restriction. For seasonal avoidance of special-status vernal pool branchiopods and vernal-pool-dependent species (e.g., vernal pool branchiopods, western spadefoot toads, California tiger salamanders), the Contractor will not work within 250 feet of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15. If any work remains to be completed after October 15, the Project Biologist will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.

Bio-MM#20. Implement and Monitor Vernal Pool Protection. Although all temporary impacts on vernal pools are considered to be permanent and will be mitigated through offsite compensatory mitigation (see BIO-MM#63), vernal pools within the temporary construction footprint will be protected by erecting exclusion fencing, if they can be avoided. The Project Biologist will erect and maintain the exclusion fencing.

For impacts on vernal pools within the temporary construction footprint that cannot be avoided, the Project Biologist will place rinsed gravel within the affected vernal pools and will cover the affected vernal pools with geotextile fabric before the start of ground-disturbing activities to

minimize damage to the soils and protect the contours. The Project Biologist will collect a representative sampling of soils from the vernal pools before initiating ground-disturbing activities within the vernal pools. The representative soil samples will contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pools. These samples may be incorporated into other vernal pools, as applicable, with USFWS and/or CDFW consultation. The Contractor will implement these measures within temporary impact areas adjacent to or within the construction footprint. Resource agency consultations with the USFWS and USACE will occur as needed and based on permit conditions.

The Project Biologist will submit a memorandum on a weekly basis or at other appropriate intervals to the Mitigation Manager to document compliance with this measure.

Because impacts to vernal pools within the temporary construction footprint are considered to be permanent impacts, these impacts will be mitigated through offsite mitigation, as described in BIO-MM#63. The Contractor will obtain approval from USACE, before the implementation of the above-described mitigation measures, for any unanticipated temporary impacts on vernal pools. If unanticipated temporary impacts last more than one full wet-dry season cycle, offsite mitigation will be implemented.

Bio-MM#48. Restore Temporary Impacts on Jurisdictional Waters. During or after the completion of construction, the Contractor will restore disturbed jurisdictional waters to original topography using stockpiled and segregated soils. In areas where gravel or geotextile fabrics have been placed to protect substrate and minimize impacts on jurisdictional waters, these materials will be removed and affected features will be restored. The Contractor will conduct revegetation using appropriate plants and seed mixes. The Authority will conduct maintenance monitoring consistent with the provisions in the Comprehensive Mitigation and Monitoring Plan (CMMP) (BIO-MM#62). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#49. Monitor Construction Activities within Jurisdictional Waters. During ground-disturbing activities, the Project Biologist and Project Biological Monitor will conduct monitoring within and adjacent to jurisdictional waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The Project Biological Monitor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures, including, but not limited to, the provisions outlined in BIO-MM#5, BIO-MM#7, BIO-MM#8, BIO-MM#10, BIO-MM#12 through BIO-MM#15, BIO-MM#47, and BIO-MM#48. The monitor will also document adherence to all relevant conservation measures as listed in the USFWS, CDFW, SWRCB, and USACE permits. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

4.1.3 Compensatory Mitigation

Unavoidable impacts on wetlands and other jurisdictional waters will require compensatory mitigation. The proposed project will provide mitigation measures in compliance with all applicable federal and state laws and regulations. To comply with these laws, a range of mitigation or compensation strategies have been developed in the Draft Compensatory Mitigation Plan (Appendix 7). These strategies will address impacts on wetlands and other waters of the U.S., as well as effects on special-status species and other biological resources that may be impacted by the Project. The range of strategies to mitigate for impacts to these resources includes onsite avoidance and minimization measures, as well as onsite and/or offsite

compensatory mitigation. The below Mitigation Measure further provides details on the compensation for impacts to jurisdictional waters.

BIO-MM#62. Prepare and Implement a Site-Specific Comprehensive Mitigation and Monitoring Plan. As part of the USFWS, USACE, SWRCB, and CDFW permit applications and before the start of ground-disturbing activities, the Authority will prepare a CMMP to mitigate for temporary and permanent impacts on biological resources (i.e., special-status wildlife, jurisdictional waters, and riparian areas). In the CMMP, performance standards, including percent cover of native species, survivability, tree height requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of onsite and/or offsite mitigation will be detailed; Preference will be given to conducting the mitigation within the same HUC-8 or HUC-6 watershed where the impact occurs. The Project Biologist will work with the USACE, SWRCB, and CDFW to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the CMMP. The CMMP will outline the intent to mitigate for the lost conditions, functions, and values of jurisdictional waters and state streambeds impacted consistent with resource agency requirements and conditions presented in Sections 404 and 401 of the CWA and Section 1600 of the CFGC. The CMMP will incorporate the following standard requirements consistent with USACE, SWRCB, and CDFW guidelines:

- Description of the project impact/site.
- Goal(s) (i.e., functions and values or conditions) of the compensatory mitigation project.
- Description of the proposed compensatory mitigation site.
- Implementation plan for the proposed compensatory mitigation site.
- Maintenance activities during the monitoring period.
- Monitoring plan for the compensatory mitigation site.
- Completion of compensatory mitigation.
- Financial assurances.
- Contingency measures.

Also, the following will be included at a minimum for the implementation plan:

- Site analysis for appropriate soils and hydrology.
- Site preparation specifications based on site analysis, including but not limited to grading and weeding.
- Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.
- Specifications for plant and seed material appropriate to the locality of the mitigation site.
- Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.

Habitat preservation, enhancement, and/or establishment or restoration activities will be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to achieve the mitigation goals. A detailed design of the mitigation habitats will be created in coordination with the permitting agencies and be described in the CMMP. It is recognized that several CMMPs will be developed consistent with the selected mitigation sites and the resources mitigated at each. The primary engineering and construction contractors will ensure, through coordination with the Project Biologist, that construction is implemented in a manner that minimizes disturbance of such areas. Temporary fencing will be used during construction to avoid sensitive biological resources that are located adjacent to construction areas and can be avoided.

Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). The performance standards are developed so that progress towards meeting final success criteria can be assessed on an annual basis; the standard for each year is progressively closer to the final criteria (e.g. vegetation cover standards may increase annually until reaching the success criteria objective in the final year of monitoring). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. Where applicable, replacement planting/seeding will be implemented if monitoring demonstrates that performance standards or success criteria are not met during a particular monitoring interval.

The performance standards will be used to determine whether the habitat improvement is trending toward sustainability (i.e., reduced need for human intervention) and to assess the need for adaptive management. These standards must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance standards will be developed in consultation with the permitting agencies and described in the CMMP.

The final success criteria will be developed in coordination with the regulatory agencies and presented in the CMMP. Examples of success criteria, which could be included in the CMMP, and would be assessed at the end of the monitoring period (assumed to be 5 years or as directed by agencies), include:

- Percent survival of planted trees (65–85%, depending on species and habitat).
- Percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (<5%).
- Percent total absolute cover of plant species (50-80%, depending on habitat type).
- Designed wetlands will meet U.S. Army Corps of Engineers criteria for hydrophytic vegetation, hydric soils, and hydrology as defined in the "Corps of Engineers wetland delineation manual" (Environmental Laboratory 1987).
- Designed vernal pools and seasonal wetlands will meet inundation and seasonal drying requirements as specified in the design and indicated by agencies.
- Species composition and community diversity, relative to reference sites, and/or as described in the guidelines issued by permitting agencies (e.g., USFWS conservation guidelines for valley elderberry longhorn beetle).

Performance standards and success criteria will be provided for each of the years of monitoring and will be specific to habitat types at each permittee-responsible mitigation site. The monitoring schedule will be detailed in the site-specific CMMPs. To be deemed successful, the site will be required to meet the performance standards established for the year in which monitoring is being conducted (e.g., monitoring conducted at intervals with increasing performance requirements). However, if performance standards are not met in specific years, remedial measures, such as regrading, adjustment to modify the hydrological regime, and/or replacement planting or seeding, must be implemented and that year's monitoring must be repeated the following year until the performance standards are met. The success criteria specified must be reached without human intervention (e.g., irrigation, replacement plantings) aside from maintenance practices described in the site-specific CMMPs for maintenance during the establishment period.

The Project Biologist will oversee the implementation of all CMMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements.

The Project Biologist will prepare annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#63. Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. The Authority will mitigate permanent and temporary wetland impacts through compensation determined in consultation with the USACE, SWRCB, USFWS, and CDFW, in order to be consistent with the CMMP (BIO-MM#62). Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFW 1600 Streambed Alteration Agreement.

Compensation shall include aquatic resources restoration, establishment, enhancement, or preservation through one or more of the following methods:

- Purchase of credits from an agency-approved mitigation bank.
- Fee-title-acquisition of natural resource regulatory agency-approved property.
- Permittee-responsible mitigation through the establishment, re-establishment, restoration, enhancement, or preservation of aquatic resources and the establishment of a conservation easement or other permanent site protection method, along with financial assurance for long-term management of the property-specific conservation values.
- In lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies.

The following ratios are proposed as a minimum for compensation for permanent impacts; final ratios will be determined in consultation with the appropriate agencies:

- Vernal pools: 2:1.
- Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type and function and values lost.
  - 1:1 offsite for permanent impacts.
  - 1:1 onsite and 0.1:1 to 0.5:1 offsite for temporary impacts.

The Authority will mitigate impacts on jurisdictional waters by replacing, creating, restoring, enhancing or preserving aquatic resource at the ratios presented above or other ratios, as determined in consultation with the appropriate agencies, which compensates for functions and values lost. The Authority will consider modifying the vernal pool mitigation ratios in the final permits based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamander, and western spadefoot toad.

Through the CMMP reporting program and the applicable terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and the CDFW 1600 Streambed Alteration Agreement, the Project Biologist will document compliance and submit it to the Mitigation Manager.

Chapter 5

Other Permitting Information

5.0 Other Permitting Information

This chapter provides supporting information about the permitting efforts and schedule for agencies other than the USACE.

5.1 Block 25: Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody

A complete list of APNs, Land Owner, and property addresses is provided as Appendix 1.

5.2 Block 26: List of Other Certifications or Approvals /Denials Received from Other Federal, State, or Local Agencies for Work Described in This Application

The Authority and the FRA are in the process of preparing agreements with environmental resource agencies to complete the environmental permitting requirements for construction. These agreements will clearly identify the Authority's responsibilities in meeting the permitting requirements of the federal, state, and regional environmental resource agencies.

Two of these agreements, Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act, are required to be completed before the project's environmental phase can be completed and the EIR/EIS is finalized. On March 24, 2011, the Department of the Army designated the FRA as the lead federal agency for Section 106 coordination and associated compliance requirements and as the lead federal action agency for purposes of Section 7 consultation. (Cohen, 2011)

Compliance with Section 106 and Section 7 is achieved through consultation between the lead federal agency, or its designated non-federal representative, and the appropriate regulatory agency. For Section 106 of the National Historic Preservation Act, the California State Historic Preservation Officer (SHPO) is responsible for providing oversight for the consultation process. The regulatory agency responsible for consultation under Section 7 of the Endangered Species Act is either the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, depending on the federally listed species under consideration.

Based on the *California High-Speed Train Fresno to Bakersfield Biological Assessment (Authority and FRA 2012)*, the proposed project may adversely affect species that are federally listed as threatened or endangered or their designated critical habitats. The Authority and the FRA have initiated consultation with the U.S. Fish and Wildlife Service, pursuant to Section 7 of the Endangered Species Act, as appropriate. The U.S Fish and Wildlife Service consultation processes are scheduled to be completed before the project's EIR/EIS is finalized. Table 5-1 lists the major environmental permits required for the HST.

The Authority and FRA determined that the project would have no effect on species protected under Section 7 of the Endangered Species Act regulated by the National Marine Fisheries Service. Several meetings and correspondence between the Authority, FRA and National Marine Fisheries Services assisted in making the no effect determination. In addition, the project will not adversely affect Essential Fish Habitat as defined in the Magnuson-Stevens Fishery Conservation and Management Act.

Table 5-1
Potential Major Environmental Permits, Reviews, and Consultations

Agency	Permit, Review, or Consultation	ID or Reference Number	Date Applied	Decision and Date
Federal				
U.S. Army Corps of Engineers (USACE)	CWA Section 404 Permit for Discharge of Dredged or Fill Materials to Waters of the U.S., including wetlands RHA Section 10 Permit for Construction of any Structure in or over any Navigable Water of the United States RHA Section 408 Permission	SPK-2009-01482	August 2011 (Preliminary) November 2013 (Draft) TBD TBD	
U.S. Department of Interior/Federal Railroad Administration	Section 4(f) of the U.S. Transportation Act of 1966		August 2011 (Preliminary) January 2014 (Final)	Tied to Final EIR/EIS
U.S. Department of Interior/National Park Service	Section 6(f) of the Land and Water Conservation Fund Act of 1965		November 2011	Tied to Final EIR/EIS
U.S. Advisory Council on Historic Preservation via the California State Historic Preservation Office (SHPO)	Section 106 Consultation (National Historic Preservation Act of 1966)		November 2011 (Preliminary) January 2014 (Final)	Tied to Final EIR/EIS
U.S. Environmental Protection Agency (EPA)	Clean Air Act Section 309 Review, including review of Environmental Justice conclusions General Conformity Determination		Tied to Final EIR/EIS Tied to Final EIR/EIS	
U.S. Fish and Wildlife Service	ESA Section 7 Consultation and Biological Opinion	08ESMF00-2012-F-0247	July 2012 October 2013	BO issued February 2013, Revised BO March 2014 (Anticipated)
National Marine Fisheries Service	ESA Section 7 Consultation and Biological Opinion		June 2011	No Effect Determination July 2011
Surface Transportation Board	Authority to construct (49 U.S.C. § 10901) or exemption from prior approval requirement (49 U.S.C. § 10502)		TBD	

Table 5-1
Potential Major Environmental Permits, Reviews, and Consultations

Agency	Permit, Review, or Consultation	ID or Reference Number	Date Applied	Decision and Date
State				
California Department of Fish and Game	California Endangered Species Act permits (Cal. Fish and Game Code Section 2081) California Fish and Game Code Section1602 Lake and Streambed Alteration Agreement		August 2012 (Preliminary) April 2014 (Final) May 2014	
State Water Resources Control Board	Clean Water Act Section 401 Water Quality Certification Section 402 National Pollutant Discharge Elimination System (NPDES) Water Discharge Permit Dewatering permit (Order No. 98-67) Spill Prevention, Control, and Countermeasure (SPCC) Plan (part of Section 402 process) Stormwater Construction and Operation Permit		March 2014 Others permits are tied to the construction start date	
California Department of Transportation (Caltrans)	Caltrans Encroachment Permits		TBD	
California Public Utilities Commission	Approval for construction and operation of railroad crossings of public roads and for construction of new transmission lines and substations		TBD	
California State Lands Commission	Lease for crossing state sovereign lands		TBD	
Regional				
San Joaquin Valley Air Pollution Control District	Rule 201 General Permit Requirements, Rule 403 Fugitive Dust, Rule 442 Architectural Coatings, and Rule 902 Asbestos		TBD	
Central Valley Flood Protection Board	Section 208 (flood protection facilities)		TBD	

Acronyms:
CWA = (Federal) Clean Water Act
RHA = (Federal) Rivers and Harbors Act
TBD = to be determined

5.2.1 Section 401 of the Clean Water Act

Under the Clean Water Act Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the U.S. must obtain certification from the state in which the discharge would originate or from the interstate water pollution control agency with jurisdiction over impacted waters that fills meet applicable water quality standards. A Water Quality Certification or a waiver, as required under Section 401 of the Clean Water Act from the California Central Valley-Regional Water Quality Control Board or State Water Resources Control Board, as applicable, will be obtained. The Authority is currently preparing an application for certification.

5.2.2 Historic Properties and Cultural Resources

The available information shows that potentially NRHP-eligible cultural resources may be impacted by the project. The lead federal agency, the FRA, has initiated consultation with the State Historic Preservation Officer under Section 106 of the National Historic Preservation Act (NHPA).

Cultural resources investigations have been undertaken for both above and below-ground resources in accordance with standard Section 106 of the NHPA, the California Environmental Quality Act (CEQA), and California Historic Preservation Office (SHPO) standards and guidelines, and in accordance with the Programmatic Agreement that was prepared for the project. A draft technical report has been prepared to document cultural resources on this project, *California High-Speed Train Fresno to Bakersfield Historic Properties Survey Report*.

Significant cultural resources, both architectural and archaeological, are presented in detail in the Historic Properties Survey Report. Extensive background research was undertaken from a variety of sources, including local historical societies, libraries, municipal offices, the CHRIS data centers, Caltrans repositories, through Native American consultation, and a wide variety of online materials, to identify all previously documented above- and below-ground cultural resources. Additionally, field studies were undertaken during 2010 for this project. For archaeological resources, all parcels of land where access could be legally obtained, along all alternatives, were field walked by qualified archaeologists. All above-ground resources built prior to 1961 were visited and documented in the field, where access was either approved, or the resource was visible from public roads/sidewalks.

The project has the potential to affect historic properties. This project is dependent upon Corps authorization of fills and discharge, therefore because of the Corps authorization, the project is a Section 106 undertaking (36 CFR Part 800.16[y]). The FRA and Authority consulted with the SHPO and other stakeholders and executed the *Programmatic Agreement Among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High Speed Rail Authority Regarding Compliance with Section 106 of the National Historic Preservation Act, As it Pertains to the California High-Speed Train Project* in 2011. The Authority and FRA are consulting with relevant parties, including the USACE, to develop and execute a memorandum of agreement specific to the Fresno-Bakersfield section. Upon execution the MOA will govern compliance with Section 106, including completion of inventory, evaluation, and treatment, for areas where permission to enter has not been granted.

The Section 106 regulations indicate that management steps required under Section 106 may be phased under a valid agreement document (36 CFR Part 800.4[b][2]). The regulations further indicate that compliance with the terms of an executed agreement document demonstrates an agency's compliance with Section 106 for all covered undertakings (36 CFR Part 800.14[b][2][iii]). The USACE will be a signatory party to the memorandum of agreement; upon

execution this document will thus demonstrate compliance with Section 106 sufficiently for USACE undertakings such as permits authorization fills.

5.2.3 Federally Endangered Species

Construction of the project may affect species federally listed as endangered or threatened or their designated critical habitats that are regulated by the Endangered Species Act of 1973. The FRA has initiated consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, pursuant to Section 7 of the Endangered Species Act, as appropriate.

There are 12 plant and wildlife species that have potential to occur within the project area that are regulated under the Endangered Species Act. The potential for federally listed species to occur is based on the presence or absence of suitable habitat identified in the habitat study area. Recovery plans prepared by the U.S. Fish and Wildlife Service that discuss the federally listed species with potential to occur in the project area, such as the *Recovery Plan for Upland Species of the San Joaquin Valley, California* and *Draft Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon*, were reviewed for additional information and species habitat requirements.

Designated critical habitat for California tiger salamander, vernal pool tadpole shrimp, and vernal pool fairy shrimp, is present within the project area. Primary constituent elements of designated critical habitat for each species are present but the action is not likely to adversely affect the critical habitat units.

The FRA has determined that the project will have no effect on federally listed species regulated by the National Marine Fisheries Service and that the project will not adversely affect Essential Fish Habitat as defined in the Magnuson-Stevens Fishery Conservation and Management Act. As described above, the FRA and Authority prepared a No Effect Determination for species regulated by the National Marine Fisheries Service in the Fresno-Bakersfield section.

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Chapter 6
References

6.0 References

The following references were used in preparation of this permit application and supporting material.

California High-Speed Rail Authority and USDOT Federal Railroad Administration (Authority and FRA). 2005. *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System.* Vol. 1, *Report.* Sacramento and Washington, D.C.: California High-Speed Rail Authority and USDOT Federal Railroad Administration.

———. 2011. *Fresno to Bakersfield Preliminary Jurisdictional Waters and Wetlands Delineation Report.* Prepared by URS/HMM/Arup Joint Venture. Sacramento and Washington, DC: California High-Speed Rail Authority and USDOT Federal Railroad Administration, June 2011.

———. 2012. *California High-Speed Train Fresno to Bakersfield Biological Assessment.* Sacramento and Washington, D.C.: California High-Speed Rail Authority and USDOT Federal Railroad Administration

———. 2014. *California High-Speed Train Project Environmental Impact Report / Environmental Impact Statement: Final EIR/EIS, Fresno to Bakersfield*. Five volumes. Sacramento, CA, and Washington, DC: California High-Speed Rail Authority and USDOT Federal Railroad Administration, 2014.

NEPA/404 MOU 2010. NEPA/ Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding. December 2010.

U.S. Army Corps of Engineers (USACE). 2008. Regulatory Guidance Letter No. 08-02: Jurisdictional Determinations. June 26, 2008.

Cohen. 2011. Letter from Mark D. Cohen, Deputy Chief of the Regulatory Division, Dept. of the Army, March 24, 2011.

40 CFR Sec 230.91. Federal Register. 2008. Federal Register Volume 73, No. 70. April 10, 2008. Rules and Regulations. Pages 19594-19705.

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Chapter 7
List of Preparers

7.0 List of Preparers

This section summarizes the URS-HMM-Arup Joint Venture employees, and provides a summary of their qualifications, roles, and responsibilities in the preparation of this report.

Permitting	
Kevin Melanephy Senior Biologist	B.S., Ecology and Systematic Biology, California Polytechnic State University, San Luis Obispo. 14 years of experience in biological resource assessments, environmental permitting, and preparation of environmental documents. • 404 permit and jurisdictional wetlands task manager
Rosemary Laird Senior Biologist	M.S., Marine Science, College of William & Mary. 18 years of experience in environmental studies, wetland delineations, permitting, and technical writing. • Internal technical review of document.
Shannon Lindquist, P.W.S. Wetland Biologist	M.S., Environmental Studies, Evergreen State College. 8 years of professional experience in wetland ecology, wetland permitting, and other technical analysis. • Performed spreadsheet calculations for impacts. • Produced tables and text for report.
Sean Rudden Environmental Permitting	B.A., Economics, Sacramento State University. 4 years of experience in environmental permitting, sustainability, and economics. • Collected and synthesized supporting information. • Composed and edited sections of this report.
Erin Maroni Biologist	B.S., Environmental Science, University of New Hampshire. 2 years of experience in general biology and permitting. • Performed detail checks and technical reviews of spreadsheets and calculations used to generate results.
GIS	
Rose Abbors Senior GIS Analyst	B.S. Geography, Arizona State University 8 Years of experience in environmental, demographic, and transportation mapping; Geographic Information System (GIS) data transformation, management, and analysis. • Technical GIS lead and map production lead. • Reviewed and assisted with maps and data production. • GIS support for project-level map and figures and tables.
Jessica Parteno Senior GIS Developer	Advanced Diploma. Geographic Information Systems. Centre of Geographic Sciences. 9 years of experience in GIS, Geodatabase design, and data management. • Development of complex habitat suitability models. • Data management of GIS information for production of wetlands-related figures and tables.

Editing	
Dennis Rowcliffe Senior Technical Editor	• B.A., American Studies and Journalism, California State University-Los Angeles. 22 years of experience conducting a variety of technical editing, document coordination, and document production duties.
Deb Fournier Senior Word Processing Technician	13 years of experience creating, formatting, and processing word-processing requests. • Formatted and prepared document for reproduction

Attachment 2:
Preliminary Engineering Design Plans

The full set of the preliminary engineering design plans is presented on the CD that accompanies this application.

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Appendix 1:
APN List

APN	Owner Name	Owner Name 2	Mailing Address			
200010004	MINA ORCHARD LLC		C/O KINZEL & CO	195 FAIRFIELD AVE #10	WEST CALDWELL NJ 07006	
002150025000	JOHNS, BRAD V		3885 8TH AVE	HANFORD CA 93230		
002120067000	STOUT, RONALD & PAMELA TRUST 50%		2004 9TH AVE	LATON CA 93242		
002120066000	STOUT, RONALD & PAMELA TRUST 50%		2004 9TH AVE	LATON CA 93242		
002060016000	TOS FARMS INC		9240 EXCELSIOR AVE	HANFORD CA 93230		
002060027000	TEVENDALE, ROBERT FAMILY TRUST		P O BOX 340	KINGSBURG CA 93631		
002190016000	NEGRETE, WILLIAM R & PATRICIA C TR 50%		C/O TOS FARMS	9240 EXCELSIOR AVE	HANFORD CA 93230	
014260088000	DIAS, MICHAEL A & G FIRST AMENDED TRUST		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014260087000	DIAS, MICHAEL A & G FIRST AMENDED TRUST		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014251043000	PINNACLE POINTE LLC		5 RIVER PARK PL E STE 102	FRESNO CA 93720		
014251006000	GRITTON TRUST		14455 LIVE OAK RD	LODI CA 95240		
014251045000	CARRILLO, LYDIA V TRUST		514 E TERRACE DR	HANFORD CA 93230		
014251040000	JOHNSON, JIMMY & DEANNA TRUST A 50%		31186 GALE AVE	COALINGA CA 93210		
014241008000	HANFORD JOINT UNION HIGH SCHOOL DISTRICT		120 E GRANGEVILLE BLVD	HANFORD CA 93230		
014230025000	ROE LIVING TRUST		12841 12TH AVE	HANFORD CA 93230		
014230024000	BETTENCOURT, NORMAN 50%		9200 E 3RD ST	HANFORD CA 93230		
014130088000	ROGERS, JAMES W IRREVOCABLE LIVING TRUST		C/O MANUEL W ROGERS TRS	P O BOX 1579	HANFORD CA 93232	
030030076	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
014090035000	BARCELLOS, DEAN & RENEE LIVING TRUST 50%		3480 N CHAPARRAL CT	HANFORD CA 93230		
014060001000	SIMAS 2004 FAMILY TRUST		5339 14TH AVE	HANFORD CA 93230		
014060050000	MC CUTCHEON, B H & B L FAM TRUST 50%		7543 ELDER AVE	HANFORD CA 93230		
014020004000	GOMEZ, JOE C & VIVIAN L H/W JT		7545 EXCELSIOR AVE	HANFORD CA 93230		
014020002000	TE VELDE, KARL & LAUREN H/W		7803 EXCELSIOR AVE	HANFORD CA 93230		
014020003000	LOHSE, ROBERT & TERESA D H/W JT		7549 EXCELSIOR AVE	HANFORD CA 93230		
014020012000	LOHSE, EILEEN L BYPASS TRUST		5686 7TH AVE	HANFORD CA 93230		
072060296	SANDRA LIFETIME TRUST	HARDING & CARBONE, INC.	3903 BELLAIRE BL	HOUSTON TX 770251119		
016260014000	RIVER RANCH FARMS LLC		6127 JACKSON AVE	HANFORD CA 93230		
016200032000	KM TRUST		P O BOX 1157	WILLCOX AZ 85644-1157		
016200033000	KM TRUST		P O BOX 1157	WILLCOX AZ 85644-1157		
016130068000	STOUT FAMILY TRUST		2725 WESTPORT DR	HANFORD CA 93230		
016130085000	KINGS COUNTY WASTE MANAGEMENT AUTHORITY		1400 W LACEY BLVD	HANFORD CA 93230		
016052028000	SANDOVAL, RENE & MARIA E H/W		1902 W BRISTOL LN	HANFORD CA 93230		

APN	Owner Name	Owner Name 2	Mailing Address			
016052011000	ALCALA, ANTONIO JR & EUNICE H/W		18266 GRANGEVILLE BLVD	LEMOORE CA 93245		
016042004000	GREEN, HARVEY		P O BOX 3165	PISMO BEACH CA 93448		
016042003000	CASIMIRO, MANUEL J REV LIV TRUST		P O BOX 326	HANFORD CA 93232		
028290043000	BOSWELL, J G CO		P O BOX 877	CORCORAN CA 93212		
028290007000	TURNER, A WAYNE & BETTY J TRUST 89.55%		2840 IRONWOOD	MORRO BAY CA 93442		
028290034000	A T & SANTA FE RAILROAD		PROPERTY TAX DEPARTMENT	P O BOX 1738	TOPEKA KS 66628	
028280020000	SPS CORCORAN LLC LESSEE		C/O SOLAR PROJECTS SOLUTIONS LLC	1999 AVE OF THE STARS #2850	LOS ANGELES CA 90067	
028260031000	STUBER, PAUL & BARBARA H H/W 66.66%		20028 8TH AVE	HANFORD CA 93230		
028260032000	KAWEAH DELTA WATER CONSERVATION DISTRICT		P O BOX 1247	VISALIA CA 93279		
028260014000	STUBER, PAUL & BARBARA H H/W 66.66%		20028 8TH AVE	HANFORD CA 93230		
028202015000	CHURCH, DON & BRENDA LIVING TRUST		8600 KANSAS AVE	HANFORD CA 93230		
028202016000	BARCELLOS, AVELINO C JR & MARY E H/W		8942 KANSAS AVE	HANFORD CA 93230		
028202031000	VALADAO DAIRY A GRN PTP		17293 9 1/2 AVE	HANFORD CA 93230		
028170036000	DESJARDINS, HAROLD M & ALICE E LIV TRUST		13159 13TH RD W	HANFORD CA 93230		
028160012000	MORALES, RUBY LIFE ESTATE		16608 8TH AVE	HANFORD CA 93230		
028160011000	DE JONG, JACOB & NICOLE H/W		6127 JACKSON AVE	HANFORD CA 93230		
028050003000	HEADRICK, DON & MELANIE LIVING TRUST		6519 IDAHO AVE	HANFORD CA 93230		
030270018000	ATCHISON, TOPEKA & SANTA FE RAILWAY		UNKNOWN			
030270019000	CITY OF CORCORAN		832 WHITLEY AVE	CORCORAN CA 93212		
030270004000	CITY OF CORCORAN		832 WHITLEY AVE	CORCORAN CA 93212		
034230001000	BOYETT FARMS		P O BOX 386	CORCORAN CA 93212		
034230047000	BOSWELL, J G CO		P O BOX 877	CORCORAN CA 93212		
034160024000	SALYER, FRED REVOCABLE TRUST		P O BOX 488	CORCORAN CA 93212		
034080020000	CAVOZOS, BELEN R 50%		5704 NEWARK AVE	CORCORAN CA 93212		
034080021000	CABRILLAS, JOE & JEAN H/W 50%		5181 SUMPTER CT	PAHRUMP NV 89061		
034070002000	GARZA, PORFIRIO JR & SANDRA R H/W		5733 NEWARK AVE	CORCORAN CA 93212		
034070003000	CAVAZOS, NOE & BERTA H/W		1116 VERDELHO CT	TULARE CA 93274		
034070011000	RAMIREZ, MIGUEL F & SANDRA H/W		1023 SAN JOAQUIN AVE	CORCORAN CA 93212		
034040005000	BANK OF THE SIERRA		P O BOX 1930	PORTERVILLE CA 93258		
034040006000	ALLEN, ROGER 10%		2745 W WALNUT AVE	VISALIA CA 93277		
034040007000	ALLEN, VIRNELL		P O BOX 112	CORCORAN CA 93212		

APN	Owner Name	Owner Name 2	Mailing Address			
034030007000	CITY OF CORCORAN		832 WHITLEY AVE	CORCORAN CA 93212		
034015014000	BECK, P R & D J REV TRUST		226 5TH AVE	CORCORAN CA 93212		
034015015000	ASHFORD, RAYMOND L & RUTH A H/W		P O BOX 13	CORCORAN CA 93212		
034015016000	HOOK, RICHARD J & CHARLENE M H/W		316 5TH AVE	CORCORAN CA 93212		
034011015000	CORCORAN IRRIGATION DISTRICT		1150 6 1/2 AVE	CORCORAN CA 93212		
034011001000	MARTIN, ELSIE 55%		234 W EARL CT	HANFORD CA 93230		
034015007000	VALOV, JOHN F 50% TRUST		18275 ROAD 28	TULARE CA 93274		
034011007000	FULLER, KAREN M 55%		5706 AVE 224	TULARE CA 93274		
33407005	JOHNSTON FLORENCE L TRUSTEE	MUSSON EVERETT W JR TRUSTEE	1747 E LINCOLN	FRESNO CA 93725		
33021110	ADAIR JOHN H	BLOWERS KENNETH J ETAL	4766 S CEDAR	FRESNO CA 93725		
33021129	CAGLIA V J TRUSTEE		2374 E AMERICAN	FRESNO CA 93725		
33021128	PIMENTAL DONALD & MICHELE		2356 E AMERICAN	FRESNO CA 93725		
33509037	MARQUEZ NOE & ANGELA		7062 S MAPLE	FRESNO CA 93725		
33432006	SCHMALL KENNETH A & KATHY		5523 S PEACH	FRESNO CA 93725		
33425059S	LAZARUS NICHOLAS & KAREN CARLENE TRS		5841 S MAPLE	FRESNO CA 93725		
33425054SU						
33517022S	BHULLAR JASWINDER S & SWARNJIT K		5377 W DONNER	FRESNO CA 93722		
33817017	MEHTANI JANAK		2300 CALIFORNIA AVE	CARMICHAEL CA 95680		
33432007	SILVA LINDA ELAINE		5835 S CEDAR	FRESNO CA 93725		
33501002U						
33511038SU						
33431013	MENDOZA LOUIS R & EMMA M		6948 S MAPLE	FRESNO CA 93725		
33514032	MORGAN DENNIS M		10172 ROLLING HILLS DR	MADERA CA 93636		
33514015	MACIAS-FIGUEROA FEDERICO & ANITA		8075 MAPLE	FRESNO CA 93725		
33517021S	MC LAIN JAMES T & GINA M		8944 S MAPLE	FRESNO CA 93725		
33509057	GONZALES ORLANDO R & JOVITA G TRUSTEES		9217 S MAPLE	FRESNO CA 93725		
33519008	RATTAN PAL & BALJIT KUMAR GP		7013 S CEDAR	FRESNO CA 93706		
33510011	GEJEIAN ALBERT & VIOLET TRUSTEES		1850 E SOUTH AVE	FRESNO CA 93725		
33511016	GEJEIAN ALBERT & VIOLET TRUSTEES		1850 E SOUTH AVE	FRESNO CA 93725		
33509018	KALEBJIAN ESTHER TRUSTEE		7262 S CEDAR	FRESNO CA 93725		
33431020	MIRANDA VELIA		6930 S CEDAR	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
33021111	GOMEZ ANTONIO JR & FRANCES SANTA		3057 E HARVARD	FRESNO CA 93703		
33509017	LAWRENCE ROLAND & ARLENE		7390 S CEDAR	FRESNO CA 93725		
33401007U	Burlington Northern & Santa Fe R.R.					
33021124U						
33431046	BARTSCH HARRY TRUSTEE		2175 E CLAYTON	FRESNO CA 93725		
33431045	BARTSCH RONALD H & GERALDINE A		2159 E CLAYTON AVE	FRESNO CA 93725		
33431001	PILEGARD RICHARD N & VIRGINIA H		35220 SHADY OAK DR	WISHON CA 93669		
04217035S	RUIZ BENJAMIN JR & SONIA		3262 E CONEJO	FRESNO CA 93725		
04223016	FRANKLIN RUFUS	FRANKLIN RUFUS	2163 E FLORAL	FRESNO CA 93725		
38521023	NASH DAIRY CO		4225 E CONEJO	SELMA CA 93662		
04217037	KAUR RAJVIR		2542 S ARGYLE	FRESNO CA 93727		
33811026S	CHATHA KULDIP SINGH & RITA SATWANT TRS		10822 S CHESTNUT	FRESNO CA 93725		
33433016	AHRENDES CARL H & SHARMAN A		5860 S CEDAR	FRESNO CA 93725		
33509056U						
33806017S	POULSEN BRUCE ARTHUR	POULSEN BRUCE A ETAL	1121 E KELSO	FRESNO CA 93720		
38502042	CAREY EVA R	CAREY EVA R	4426 N FRUIT	FRESNO CA 93705		
04217034S	SHELBY TOMMY R & JENNY L TRUSTEES		2628 E NEBRASKA	FRESNO CA 93725		
38520005	MARKARIAN ROBERT B & DEBORA A		4357 S FRUIT	FRESNO CA 93706		
04217027S	HILL SHARON LANETTE	HILL SHARON LANETTE	11761 S CHERRY AVE	FRESNO CA 93725		
33810029	SOURIYANYONG OUTHAI	SURIYANNHONG PHETSAMONE	620 N BROADWAY	FRESNO CA 93728		
33517019	CEDAR AVENUE PROPERTIES LTD		8570 S CEDAR	FRESNO CA 93725		
04217028S	CRUFF LARRY S & SHARON A TRUSTEES		6518 E NEBRASKA	SELMA CA 93662		
38518050S	LEONARDO BROS DAIRY		16508 S CLOVIS AVE	SELMA CA 93662		
38517051	SILVEIRA OLIVIA I TRUSTEE		12806 S FOWLER	SELMA CA 93662		
38505115S	ERICKSON DEBBIE TRUSTEE		P O BOX 36	FOWLER CA 93625		
04219042S	SHUBIN WILLIAM M & MARTHA TRUSTEES		7033 W RIALTO	FRESNO CA 93723		
38505107S	KULAR SUKHWINDER SINGH & SHINDERPAL K		3446 E MOUNTAIN VIEW	SELMA CA 93662		
38501010U						
38508120S	HOPSON DARLENE SHIRLEY		P O BOX 956	SELMA CA 93662		
05602008S	DIEPERSLOOT JOHN A & SUSAN COLLEEN		41208 RD 32	KINGSBURG CA 93631		
05603039S	GREWAL PARMJIT S & GURINDER K TRS		16576 S FOWLER	SELMA CA 93662		
38501009U						

APN	Owner Name	Owner Name 2	Mailing Address			
38501008U						
38501003U						
38508122S	MANGLONA SANGWAN	MANGOLA SANGWAN	13486 S CHESTNUT	SELMA CA 93662		
38508127	CARDOZA JOHNNY J & JOAN I TRUSTEES		388 E KLEPPER	CARUTHERS CA 93609		
38501011U						
05603024S	CARTER RAY L & JUDY C FAM LTD PTNRSHIP	CARTER SCOTT KERNICK TRUSTEE ETAL	5009 GADWALL CIR	STOCKTON CA 95207		
38508130	ATWAL RAMINDER S & JASBINDER K	ATWAL RAMINDER S & JASBINDER K	622 S CLAREMONT	FRESNO CA 93727		
38517006S	RAVEN FAMILY LIMITED PARTNERSHIP		5700 E CLARKSON	SELMA CA 93662		
33021X01						
33401012U	Burlington Northern & Santa Fe R.R.					
04218013	DOYEL JOHN D & OLIVE B LIFE ESTATE		12347 S CHESTNUT	FRESNO CA 93725		
04219040S	SHUBIN WILLIAM M & MARTHA TRUSTEES		7033 W RIALTO	FRESNO CA 93723		
33810003	YUYAMA AGNES M		2175 SPRINGFIELD	FRESNO CA 93725		
04216021SU						
33811038S	HUDSON HAROLD L TRUSTEE		2310 E FLORAL	FRESNO CA 93725		
48004015S	FRESNO PROPERTY LLC		P O BOX 23666	PORTLAND OR 97281		
48001032U	Burlington Northern & Santa Fe R.R.					
47816314	DILLDINE WAYMON W & BARBARA K TRS		6762 E BELMONT AVE	FRESNO CA 93727		
33006034S	CEDAR NORTH INVESTMENT PARTNERS LLC		P O BOX 1031	FRESNO CA 93714		
47822111	BONILLA JULIO F SR		1900 35TH AVE	SAN FRANCISCO CA 94116		
47809402	BESSANOV MICHAIL & NATALIA		732 EL PASO	CLOVIS CA 93611		
47809403	BESSANOV MICHAIL & NATALIA		732 EL PASO	CLOVIS CA 93611		
48001017U						
48710035	COSSETTE INVESTMENT COMPANY INC		P O BOX 9354	FRESNO CA 93791		
47903073	TOOR GARY		PO BOX 8466	FRESNO CA 93747		
47914010	HAGOPIAN LAWRENCE S & BLYTHE E		2468 W MAGILL	FRESNO CA 93711		
48705070	SHUEMAKE MICHAEL LOUIS	SHUEMAKE SAMUEL LOUIS & LINDA ELLEN	P O BOX 12427	FRESNO CA 93777		
48001031U	Burlington Northern & Santa Fe R.R.					
46702047	MODERN CUSTOM FABRICATION INC		% MODERN WELDING CO	ATTN J JONES	2880 NEW HARTFORD RD	OWENSBORO KY 42303
291020021	TE VELDE GREGORY J		5850 AVENUE 160	TIPTON CA 93272		

APN	Owner Name	Owner Name 2	Mailing Address			
291020022	TE VELDE GREGORY J		5850 AVENUE 160	TIPTON CA 93272		
46702031U						
47907216	DURFEE SUSAN V	DURFEE SUSAN	2190 WASHINGTON ST #701	SAN FRANCISCO CA 94109		
48015211	GONZALEZ JUAN L		2336 S ORINDA	FRESNO CA 93701		
47810104	OCHOA ANDREW V JR		2155 S G	FRESNO CA 93721		
48001008U	Union Pacific Railroad Co					
48015310	GUERRERO MARY		1801 KEELER ST	BURBANK CA 91504		
33001010U						
48001011U	Union Pacific Railroad Co					
48714015T	FRESNO IRRIG DIST					
46702033U						
33006044S	OGANYAN RUBIKOVICH		7580 N VISTA	FRESNO CA 93722		
48018210	IMMOBILIARE LLC		P O BOX 15222	FRESNO CA 93702		
48710004	PROFESSIONAL ASBESTOS REMOVAL CORP		P O BOX 10077	FRESNO CA 93745		
48705071	SHUEMAKE MICHAEL LOUIS	SHUEMAKE SAMUEL LOUIS & LINDA ELLEN	P O BOX 12427	FRESNO CA 93777		
47816316T	FRESNO CITY OF					
48001009U	Union Pacific Railroad Co					
487010134	SCHROEDER AL & ALICE	SCHROEDER JOHN J & VIVIAN TRS	2043 ALAMOS AV	CLOVIS CA 936114132		
487010159	NACHTIGALL TERRY A JENNIFER A JT LIV TR	NACHTIGALL TERRY A & JENNIFER A TRS	11311 QUEENSBURY DR	BAKERSFIELD CA 93312		
487020133	JEFFRIES BROS INC		145 VULTEE ST	SHAFTER CA 93263		
487020141	A T & SF RR					
487250235	WASCO CITY OF		PO BOX 728	WASCO CA 93280		
487250243	SUNNYGEM LLC		500 N F ST	WASCO CA 93280		
487250292	CITY OF WASCO		764 E ST	WASCO CA 93280		
489041129	TORRES JOSE S		2020 SUNSET AV	WASCO CA 93280		
888888888						
888888888						
888888888						
888888888						
291080012	CORCPORK COMPANY		500 NEWPORT CENTER DRIVE #910	NEWPORT BEACH CA 92660		

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APN	Owner Name	Owner Name 2	Mailing Address			
291010009	HANSEN PHILLIP W(TR)(SEP PROP TR)		C/O HANSEN RANCHES	P O BOX 398	CORCORAN CA 93212	
291030031	MORRIS PROCTOR INC		P O BOX 623	CORCORAN CA 93212		
291040005	J G BOSWELL CO		P O BOX 877	CORCORAN CA 93212		
291060016	VALOV JOHN F		18275 RD 28	TULARE CA 93274		
291060019	CORCPORK INC		500 NEWPORT CENTER DR #910	NEWPORT BEACH CA 92660		
291080006	BRECKENRIDGE MARY(TR)(BRECKENRIDGE		715 FAIRWAY DRIVE	BAKERSFIELD CA 93309		
311030021	SCHAKEL FAMILY PARTNERSHIP LP		PO BOX 1017	TIPTON CA 93272		
311030024	SCHAKEL FAMILY PARTNERSHIP LP		PO BOX 1017	TIPTON CA 93272		
311090023	GUTIERREZ JAIME B		679 ROAD 152	DELANO CA 93215		
313040003	ELLIOTT MARY MARGARET		32442 NAUTILUS WAY	SAN JUAN CAPISTRANO CA 92675		
313040004	LARA JOHN H		640 HIGH ST STE A	DELANO CA 93215		
313050002	ALPAUGH IRRIGATION DISTRICT		PO BOX 129	ALPAUGH CA 93201-0129		
313060001	ALPAUGH IRRIGATION DISTRICT		ATTN: LAVON PENROD, MANAGER	P O BOX 129	ALPAUGH CA 93201-0129	
313060009	WEST ISLE LINE INC		C/O DON BOLLARD	P O BOX 148	ALPAUGH CA 93201	
333090024	JOHN HANCOCK LIFE INSURANCE COMPANY		301 E MAIN STREET	TURLOCK CA 95380		
333102050	LIEBMAN HYMAN ET AL		12955 RIVERSIDE DR #309	SHERMAN OAKS CA 91423		
333103005	BROWN BARBARA J(TR)(FAM TR)		3049 BARKLEY AVE	SANTA CLARA CA 95051		
333120002	COLE A S		1836 TERRACE PLACE	DELANO CA 93215		
333360001	PHILLIPS GRAIN CO		P O BOX 548	DELANO CA 93216		
333370001	LARA JOHN H		640 HIGH ST STE A	DELANO CA 93215		
333370002	PHILLIPS JACK C & DORIS M (CO-TRS)		P O BOX 548	DELANO CA 93216-0548		
333380003	JOHN HANCOCK LIFE INS CO (USA)		301 E MAIN ST	TURLOCK CA 95380		
333380004	JOHN HANCOCK LIFE INS CO (USA)		301 E MAIN ST	TURLOCK CA 95380		
333390001	WILLIAMS LOUIS & URCEL T (TRS)(W LI		C/O LUFINA WILCOX	2823 PARK ST	BERKELEY CA 94702	
026010298	BRITZ AGRICULTURAL FINANCE CO INC	TURPIN TOM	P O BOX 9050	FRESNO CA 937909050		
026010306	RIGGS POLLINATION LLC		2214 HOLLY LN	NEWPORT BEACH CA 926635423		
027360130	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
027370022	A T & S F R R		5200 E SHIELA ST	LOS ANGELES CA 90040		
028180198	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028180370	HELENA CHEMICAL CO	D&P #412-05-0000042081	P O BOX 260888	PLANO TX 760260888		
028180628	WEAVER FAMILY LP		15511 JOHNSON RD	BAKERSFIELD CA 93314		

APN	Owner Name	Owner Name 2	Mailing Address			
028180636	WEAVER FAMILY LP		15511 JOHNSON RD	BAKERSFIELD CA 93314		
028180644	WEAVER FAMILY LP		15511 JOHNSON RD	BAKERSFIELD CA 93314		
028290161	FURROW LAND CO LLC	FRANZ D MARK	474 OLEANDER AV	SHAFTER CA 93263		
030020093	GOLDEN VALLEY RANCHES A CO-PARTNERSHIP		17403 BEECH AV	SHAFTER CA 93263		
030020325	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030030134	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030441067	LOWE BROS HAY SERVICE INC		P O BOX P	WASCO CA 93280		
030441075	LOWE BROS HAY SERVICE INC		2617 BETTIS AV	WASCO CA 93280		
047130091	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130109	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130117	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047060058	DELGADILLO HECTOR L		P O BOX 625	DELANO CA 932160625		
047110036	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110051	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120076	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120084	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120092	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047220074	FABBRI DANIEL L & WENDY Y		PO BOX 82395	BAKERSFIELD CA 93380		
047220249	SEMITROPIC WATER STORAGE DIST		P O BOX Z	WASCO CA 93280		
047260153	SECTION 26 ALMOND ORCHARD LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
047290101	DAVIS FAMILY TR		729 SALEM ST	DELANO CA 932153126		
047290119	FABBRI DANIEL L & WENDY Y		PO BOX 82395	BAKERSFIELD CA 93380		
047290127	SILVER PLAIN FARM INC		PO BOX 5260	SAN LUIS OBISPO CA 934035260		
047340328	TFALP INV VEHICLE 1 LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
059280313	IAFRATI FARMS LTD PTP	IAFRATI TONY M TRS	P O BOX 1212	DELANO CA 93215		
059210351	NO KERN WATER STORAGE DIST		PO BOX 81435	BAKERSFIELD CA 933081435		
059252056	IAFRATI JON ANTHONY		P O BOX 1212	DELANO CA 932161212		
059252064	IAFRATI JON ANTHONY		P O BOX 1212	DELANO CA 932161212		
059252072	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
059280735	NACHTIGALL TERRY A JENNIFER A JT LIV TR	NACHTIGALL TERRY A & JENNIFER A TRS	11311 QUEENSBURY DR	BAKERSFIELD CA 93312		
060140167	LEROY EUGENE R TRUST	CAPS	7108 N FRESNO ST	FRESNO CA 93720	STE 401	

APN	Owner Name	Owner Name 2	Mailing Address			
071050074	VINTAGE NURSERIES LLC	CHIEF EXECUTIVE OFFICER	PO BOX 279	WASCO CA 932800279		
071050215	REYES ROSARIO L		P O BOX 74	LOST HILLS CA 93249		
072050016	NEUFELD FMLY TR & NEUFELD J R		P O BOX 8014	WASCO CA 93280		
072050206	BASHOR L S & S D		P O BOX 82336	BAKERSFIELD CA 93380		
072110273	MALOFY FAMILY TRUST	MALOFY LOUISE C TRS	15850 WASCO AV	WASCO CA 932809603		
072120017	SCHROEDER BEN J & YVETTE D	DOUDNEY DOUG	1443 BUCKWOOD DR	ORLANDO FL 32806		
072120140	ALBERTSON JOHN R & JUANITA		P O BOX 119	WASCO CA 93280		
072120157	SHAFTER-WASCO IRRIGATION DIST		UNKNOWN	CA		
072120173	SCHROEDER BEN J & YVETTE D	DOUDNEY DOUG	1443 BUCKWOOD DR	ORLANDO FL 32806		
072170137	MC CONNELL & FULWYLER		P O BOX M	WASCO CA 93280		
072180011	SUN WORLD INTERNATIONAL LLC		16350 DRIVER RD	BAKERSFIELD CA 93308		
072190036	SUN WORLD INTERNATIONAL LLC		16350 DRIVER RD	BAKERSFIELD CA 93308		
072200058	FAMILY TREE FARMS LLC		11721 STINE RD	BAKERSFIELD CA 93313		
072240013	MELVIN M MC CONNELL FARMS		P O BOX M	WASCO CA 93280		
072240047	PIONEER FARM EQUIPMENT CO		P O BOX 12406	FRESNO CA 93777		
072240054	PIONEER FARM EQUIPMENT CO		P O BOX 12406	FRESNO CA 93777		
089150015	DOUBLE D LAND CO LLC	DANIEL CARL R	16201 JOHNSON RD	BAKERSFIELD CA 93314		
089020119	JEFFRIES RYAN & BUNNY		1145 FAIRWAY DR	BAKERSFIELD CA 93309		
089020135	JEFFRIES FAMILY L P		P O BOX 1570	SHAFTER CA 93263		
089070239	POPLAR FARMS INC	SHAFTER-WASCO GINNING CO INC	PO BOX 1567	SHAFTER CA 932631567		
089070353	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
090020108	GROSS ALICE PAINTER		1005 PARADISE WY	PALO ALTO CA 94306		
090020140	LESLIE WILLIAM F & MARY JEAN		18631 CENTRAL VALLEY HY	SHAFTER CA 93263		
090020165	HARRIS SPENCER S & TAMMY K		31350 BURBANK ST	SHAFTER CA 93263		
090180134	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091270215	AMMERMAN TIMOTHY J & TERESA L		32174 7TH STANDARD RD	SHAFTER CA 932639772		
091270223	ZIMMERMAN RICHARD T	AMMERMAN TASHA ROSE A/S	424 N MIAMI AV	FRESNO CA 93727		
091270413	BISHOP ACRES MUTUAL WATER CO		P O BOX 80392	BAKERSFIELD CA 93380		
091270421	PENTECOSTAL CHR OF GOD-7TH STD	DOLPHUS CATER ET AL TRS	32186 7TH STANDARD RD	SHAFTER CA 932639772		
091270439	SNAPP LINDA DIANE		19481 SANTA FE WY	SHAFTER CA 93263		
091251066	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		

APN	Owner Name	Owner Name 2	Mailing Address			
091251488	SHAFTER CITY OF		336 PACIFIC AV	SHAFTER CA 93263		
091251496	BNSF RY CO		BOX 961089	FORT WORTH TX 761610089		
091251504	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091260034	AT & SF RR		5200 E SHIELA ST	LOS ANGELES CA 90040		
091260539	BNSF RY CO	PROPERTY TAXES	BOX 961089	FT WORTH TX 761610089		
002200039000	ESAJIAN, GARY E & ELENE P FAMILY TRUST		P O BOX 550	KINGSBURG CA 93631		
002200013000	SASIN FAMILY REVOCABLE TRUST 50%		WELSEY E & ALICE SASIN CO-TRUSTEES	116 E 6TH ST	HANFORD CA 93230	
002200015000	SKARMOUTSOS FAMILY TRUST 5.154%		C/O NORMA J SKARMOUTSOS	27440 ELENA RD	LOS ALTOS HILLS CA 94022	
002190005000	BETTENCOURT, JOHN S LIVING TRUST		3991 N 10TH AVE	HANFORD CA 93230		
002150043000	OLIVEIRA, LOUIS R FAMILY TRUST		14253 LACEY BLVD	HANFORD CA 93230		
002120036000	FLOOD, ROGER & ANDREA LIVING TRUST		636 FLAG CREEK RD	OROVILLE CA 95965		
002120069000	STOUT, RONALD & PAMELA TRUST 50%		2004 9TH AVE	LATON CA 93242		
002120046000	DOWNS, EDWARD W BYPASS TRUST 50%		C/O SHARON MORTON	2646 9 1/2 AVE	LATON CA 93242	
002120047000	DOWNS, EDWARD W BYPASS TRUST 50%		C/O SHARON L MORTON TRS	2646 9 1/2 AVE	LATON CA 93242	
002190006000	BETTENCOURT, JOHN S LIVING TRUST		3991 N 10TH AVE	HANFORD CA 93230		
002190008000	BRAZIL, GARY & JEANETTE H/W		4442 8TH AVE	HANFORD CA 93230		
002190007000	ROSA, MIKE J TESTAMENTARY TRUST		C/O ANGIE ROSA	2475 FAIRMONT DR	HANFORD CA 93230-6803	
014390015000	RAMIREZ, JIM & HELEN M H/W		9780 PONDEROSA ST	HANFORD CA 93230		
014390016000	CASTILLO, RAMON B JR & MARY E H/W		9724 PONDEROSA ST	HANFORD CA 93230		
014260066000	SOUTHERN PACIFIC TRANSPORTATION CO		PROPERTY TAX DEPT	UNION PACIFIC CORPORATION	1700 FARNAM ST 10TH FLOOR S	OMAHA NE 68102-2010
014260101000	SOUTHERN CALIFORNIA EDISON CO		2131 WALNUT GROVE AVE 2ND FLOOR	ROSEMEAD CA 91770		
014251051000	SOUZA'S ENTERPRISES INC		P O BOX 1285	HANFORD CA 93232		
014251007000	GRITTON TRUST		14455 LIVE OAK RD	LODI CA 95240		
014251044000	PINNACLE POINTE LLC		5 RIVER PARK PL E STE 102	FRESNO CA 93720		
014251027000	REYNOSO, LORENZO G & BERTHA A H/W		1584 MATEUS CT	TULARE CA 93274		
014251010000	REYNOSO, LORENZO G & BERTHA A H/W		8448 LACEY BLVD	HANFORD CA 93230		
014242010000	VENEGAS, JOSE J & MARTHA L H/W		8516 LACEY BLVD	HANFORD CA 93230		
014241022000	LIND, KIRK E & PAMELA J H/W		P O BOX 1263	LONGMONT CO 80502		
014241021000	LIND, KIRK E & PAMELA J H/W		P O BOX 1263	LONGMONT CO 80502		
014241004000	FONSECA, FEDERICO M & SUZIE B H/W		P O BOX 1722	HANFORD CA 93232		
014242011000	GUERRA, FELIPE J & PATRICIA R H/W		11130 9 1/4 AVE	HANFORD CA 93230		

APN	Owner Name	Owner Name 2	Mailing Address			
014241003000	CUMMINGS, MELVIN L & JANIS L H/W JT		8954 LACEY BLVD	HANFORD CA 93230		
014241018000	MUHRRAM, FAWZI 50%		426 E 7TH ST	HANFORD CA 93230		
014241016000	TOPETE, ALFONSO V		9990 COUNTRY LN	HANFORD CA 93230		
014241009000	TIRADO, ALBA G 50%		9991 COUNTRY LN	HANFORD CA 93230		
014230083000	CAL-CLARK FARMS INC		P O BOX 221815	CARMEL CA 93922		
014230061000	SOUTHERN PACIFIC TRANSPORTATION CO		PROPERTY TAX DEPT	UNION PACIFIC RAILRAOD CO	1700 FARNAM ST 10TH FLOOR S	OMAHA NE 68102-2010
014230022000	LEAMAN, J EDWARD & LEAH M H/W		329 BRENNEMAN RD	WILLOW STREET PA 17584		
014230026000	WEAVER, MELVON C & MARDEL I TRUST		9246 LACEY BLVD	HANFORD CA 93230		
014230013000	REED, SYLVIA ESTATE		C/O PATRICIA ANN REED	2796 S MAIN RD UNIT 4	LEBANON OR 97355	
014130062000	DIAS, MICHAEL A & GERMAINE REV LIV TRUST		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014130074000	SOARES, GEORGE & GLORIA REV FAMILY TRUST		7701 SILVA RANCH WAY	SACRAMENTO CA 95831		
014130058000	SOARES, GEORGE & GLORIA REV FAMILY TRUST		7701 SILVA RANCH WAY	SACRAMENTO CA 95831		
014090049000	DIAS, MICHAEL & GERMAINE AMND REV TR 50%		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014090047000	DIAS, MICHAEL & GERMAINE AMND REV TR		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014090002000	BARCELLOS, FRANK BYPASS TRUST 50%		7721 FLINT AVE	HANFORD CA 93230		
014090007000	GASPAR, MANUEL & FILOMENA REV LIV TRUST		7801 7 1/2 AVE	HANFORD CA 93230		
014090025000	TEIXEIRA, JOHN FARMS INC		8290 FLINT AVE	HANFORD CA 93230		
014090024000	TEIXEIRA, JOHN FARMS INC		8290 FLINT AVE	HANFORD CA 93230		
014060020000	KOSTELNIK, ALICE		7620 FLINT AVE	HANFORD CA 93230		
014060043000	FELIPE FAMILY TRUST		6520 7TH AVE	HANFORD CA 93230		
014060058000	M C LAND COMPANY		7297 ELDER AVE	HANFORD CA 93230		
014060039000	FAGUNDES, MYRON & ELLEN H/W		7323 ELDER AV	HANFORD CA 93230		
014060034000	FELIPE FAMILY TRUST		6520 7TH AVE	HANFORD CA 93230		
014060044000	FELIPE FAMILY TRUST		6520 7TH AVE	HANFORD CA 93230		
014020006000	LOHSE, VERNON R LIVING TRUST 50%		5686 7TH AVE	HANFORD CA 93230		
016260001000	RIVER RANCH FARMS LLC		6127 JACKSON AVE	HANFORD CA 93230		
016260015000	TOLEDO, JOHN & KELLI M H/W 75%		29802 ROAD 44	VISALIA CA 93291		
016200042000	DIAS, GABRIEL M 50%		4767 12TH AVE	HANFORD CA 93230		
016200043000	DIAS, GABRIEL M 50%		4767 12TH AVE	HANFORD CA 93230		
016200031000	LEAL, MYRON & HELENA FAMILY TRUST		12614 7TH AVE	HANFORD CA 93230		
016200035000	MARTELLA, ROBIN W REV TRUST		P O BOX 7687	VISALIA CA 93290		

APN	Owner Name	Owner Name 2	Mailing Address			
016200005000	MARTELLA, ROBIN W REV TRUST		P O BOX 7687	VISALIA CA 93290		
016200034000	BANK OF AMERICA		1800 TAPO CANYON RD	SIMI VALLEY CA 93063		
016200021000	BANK OF AMERICA		1800 TAPO CANYON RD	SIMI VALLEY CA 93063		
016200010000	DIAS, JOE & ANGELINA LIVING TRUST 75%		11951 7TH AVE	HANFORD CA 93230		
016130083000	STOUT FAMILY TRUST		C/O STEPHEN & KAREN STOUT	2725 WESTPORT DR	HANFORD CA 93230	
016130082000	UELAND, MARTIN E & DONNA M FAMILY TRUST		5225 N VIA AMORE	FRESNO CA 93711		
016130081000	KOSTER FAMILY REVOCABLE TRUST		1629 S JACQUES CT	VISALIA CA 93277		
016130060000	SOUTH VALLEY MATERIALS INC		C/O RYAN INC	13155 NOEL RD STE 100	DALLAS TX 75240	
016130053000	LEAL, DANIEL & BELLE LIVING TRUST		6236 HANFORD-ARMONA RD	HANFORD CA 93230		
016070037000	LEVARIO, ELSIE		2495 SPRUCE ST	HANFORD CA 93230		
016070038000	COELHO, GLORIA J LIVING TRUST		8881 HOUSTON AVE	HANFORD CA 93230		
016070049000	ALCARAZ, FLORITA		7252 HANFORD-ARMONA RD	HANFORD CA 93230		
016070052000	CORONADO, FLORIBERTA		7216 HANFORD-ARMONA RD	HANFORD CA 93230		
016070051000	COX, WALLACE G & ALICE 50% H/W		7184 HANFORD-ARMONA RD	HANFORD CA 93230		
016070050000	CORONADO, JESUS JR		7140 HANFORD-ARMONA RD	HANFORD CA 93230		
016070014000	PEREIRRA, JOSEPH B		P O BOX 387	HANFORD CA 93232		
016051034000	PATEL, JAGDISH & HANSA H/W		8749 E LACEY BLVD	HANFORD CA 93230		
016051011000	PATEL, JAGDISH & HANSA H/W		8749 E LACEY BLVD	HANFORD CA 93230		
016051012000	PATEL, JAGDISH & HANSA H/W		8749 E LACEY BLVD	HANFORD CA 93230		
016051013000	MARQUEZ, MARTIN		P O BOX 643	COALINGA CA 93210		
016051031000	ALI, ZUBEDA A		RE: EQUIPMENT & FIXTURES	735 HOUSTON AVE	VISALIA CA 93292	
016042005000	GREEN, HAROLD & CYNTHIA H/W		883 LAURENCE CT	HANFORD CA 93230		
016042064000	OLAM WEST COAST INC		205 E RIVER PARK CIR #310	FRESNO CA 93720		
016043018000	GILKEY, ROY W		521 JULIA CIR	HANFORD CA 93230		
028290033000	A T & SANTA FE RAILROAD		PROPERTY TAX DEPARTMENT	P O BOX 1738	TOPEKA KS 66628	
028260028000	TURNER, WILLIAM D & BELVA H/W		P O BOX 296	CORCORAN CA 93212		
028260044000	A T & SANTA FE RAILROAD		PROPERTY TAX DEPARTMENT	P O BOX 1738	TOPEKA KS 66628	
028204011000	DE JONG, PETER J & INGRID H/W 50%		7905 KANSAS AVE	HANFORD CA 93230		
028203013000	HOLLANDIA FARMS INC		622 E MISSION RD	SAN MARCOS CA 92069		
028203001000	XAVIER, ELIZABETH C 11.11%		C/O DAVID CHURCH	405 E SYCAMORE DR	HANFORD CA 93230	
028202005000	MATTOS, TONY A JR & ERNESTINE H/W		8480 KANSAS AVE	HANFORD CA 93230		
028202003000	MATTOS, TONY A JR & ERNESTINE H/W		8480 KANSAS AVE	HANFORD CA 93230		

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APN	Owner Name	Owner Name 2	Mailing Address			
028202004000	LAKESIDE CEMETERY		UNKNOWN			
028202013000	CHURCH, CLINTON R 25%		8600 KANSAS AVE	HANFORD CA 93230		
028202032000	VALADAO DAIRY PTP		17293 9 1/2 AVE	HANFORD CA 93230		
028202014000	VENTURA, ACACIO J & GLORIA M FAM TRST		C/O MICHAEL VENTURA	5747 SPANISH BAY CT	SPARKS NV 89436	
028202030000	MATTOS, TONY JR		8480 KANSAS AVE	HANFORD CA 93230		
028205005000	KINGS COUNTY WATER DISTRICT		200 N CAMPUS	HANFORD CA 93230		
028205001000	MACHADO, TONY G 16.66%		8800 LANSING AVE	HANFORD CA 93230		
028205006000	MACHADO, TONY G 16.66%		8800 LANSING AVE	HANFORD CA 93230		
028205008000	MACHADO, TONY G 16.66%		8800 LANSING AVE	HANFORD CA 93230		
028205007000	BROOKS, JOHNATHAN L & VICTORIA J H/W		8463 KANSAS AVE	HANFORD CA 93230		
028202039000	CHURCH, DON & BRENDA LIVING TRUST		8600 KANSAS AVE	HANFORD CA 93230		
028202038000	CHURCH, DONALD R & BRENDA J H/W CP 55%		8600 KANSAS AVE	HANFORD CA 93230		
028202039000	CHURCH, DON & BRENDA LIVING TRUST		8600 KANSAS AVE	HANFORD CA 93230		
028202034000	CHURCH, DON & BRENDA LIVING TRUST		8600 KANSAS AVE	HANFORD CA 93230		
028170042000	GALHANDRO, MANUEL JR & DIANA FAM TRUST		7876 KENT AVE	HANFORD CA 93230		
028170040000	DE JONG, JACOB & NICOLE H/W		6127 JACKSON AVE	HANFORD CA 93230		
028170041000	DE JONG, JACOB & NICOLE H/W		6127 JACKSON AVE	HANFORD CA 93230		
028090017000	CLARKE, GREGG E & TIFFANY R REVOC TRUST		218 CENTER ST	SAN RAFAEL CA 94901		
028080008000	DE JONG, JACOB & NICOLE H/W		6127 JACKSON AVE	HANFORD CA 93230		
028080015000	DE JONG, JACOB & NICOLE H/W		6127 JACKSON AVE	HANFORD CA 93230		
028080004000	BRAZIL, ROBERT E REV TRUST		C/O BRAZIL, ROBERT E	13266 7TH AVE	HANFORD CA 93230	
028050022000	BRAZIL, ROBERT E REV TRUST		C/O ROBERT E BRAZIL	13266 7TH AVE	HANFORD CA 93230	
028050023000	MELGA CANAL CO		P O BOX 877	CORCORAN CA 93212		
028050006000	HEADRICK, DON & MELANIE LIVING TRUST		6519 IDAHO AVE	HANFORD CA 93230		
028050015000	MARCHBANKS, GARY A & KAREN D H/W		14419 8TH AVE	HANFORD CA 93230		
028050016000	RIVER RANCH FARMS LLC		6127 JACKSON AVE	HANFORD CA 93230		
030270003000	SOLIS, PAUL & GLORIA H/W JT		5704 NEWARK AVE	CORCORAN CA 93212		
034230050000	MINA ORCHARD LLC		C/O KINZEL & CO LLC	195 FAIRFIELD AVE STE 1D	WEST CALDWELL NJ 07006	
034230035000	PREMIERE FARMLAND PARTNERS IV LP		C/O WESTCHESTER GROUP	2004 FOX DR STE L	CHAPAIGN IL 61820	
034160002000	ALLEN, DEWEY A & KAREN A H/W JT		529 ORANGE AVE	CORCORAN CA 93212		
034080035000	CORCORAN HOLDINGS COMPANY LLC		P O BOX 2344	MERCED CA 95344		
034070019000	CORCORAN HOLDINGS COMPANY LLC		P O BOX 2344	MERCED CA 95344		

APN	Owner Name	Owner Name 2	Mailing Address			
034060017000	VILLARREAL, MONICA 33.33%		1375 ELM CT	HANFORD CA 93230		
034040014000	COLLINS, DENNIS P & PENNY A H/W		24255 5 1/2 AVE	CORCORAN CA 93212		
034040011000	TORRES, IGNACIO & MARIA H/W		24295 5 1/2 AVE	CORCORAN CA 93212		
034040008000	JACKSON, ARTHUR		24313 5 1/2 AVE	CORCORAN CA 93212		
034030011000	TILLMAN, LARRY J & SUSAN D H/W		P O BOX 582	CORCORAN CA 93212		
034030014000	PTACEK, MARCUS J & LINDA J H/W		301 5TH AVE	CORCORAN CA 93212		
034030010000	PTACEK, MARK & LINDA H/W		301 5TH AVE	CORCORAN CA 93212		
034014012000	CITY OF CORCORAN		832 WHITLEY AVE	CORCORAN CA 93212		
034015005000	CRAVENS, SAM & JOYCE FAMILY TRUST		5271 NILES AVE	CORCORAN CA 93212		
034015018000	WALKER, NORMAN & GERALDINE H/W		221 5 1/2 AVE	CORCORAN CA 93212		
034014015000	CITY OF CORCORAN		832 WHITLEY AVE	CORCORAN CA 93212		
034011014000	A T & SANTA FE RAILROAD		PROPERTY TAX DEPARTMENT	P O BOX 1738	TOPEKA KS 66628	
04217016S	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
33435060	DELA TORRE MARIA ELENA & JAIME		5437 S CEDAR	FRESNO CA 93725		
48009012	CHURCH AVENUE INVESTORS LLC		ATTN R AINSWORTH	941 BURGAN	CLOVIS CA 93611	
33433047	LEWIS JOHN D & VERONICA L TRUSTEES		5734 S CEDAR	FRESNO CA 93725		
33425056U						
33425043	YERGAT ANN ZABELLA TRUSTEE	YERGAT JOHN ARA TRUSTEE ETAL	2304 S BEVERLY GLEN BLVD	#103	LOS ANGELES CA 90064	
33517028S	SMITH GLENN A & BARBARA L TRUSTEES	OF G A & B L SMITH F/T DTD 3-6-90	8506 S MAPLE	FRESNO CA 93725		
33511037	ROSS FAMILY PROPERTIES LLC		7828 S MAPLE	FRESNO CA 93725		
33808030	AVEDISIAN LINDA G TRUSTEE	ESKELSEN GLENN & MICHELLE	3516 E DINUBA	FRESNO CA 93725		
33511002	GENTLE WILLIAM R TRUSTEE		7818 S CHERRY	FRESNO CA 93725		
33514005	GEJEIAN ALBERT & VIOLET TRUSTEES		1850 E SOUTH AVE	FRESNO CA 93725		
33514037	RUIZ TERESA		5782 S ELM	FRESNO CA 93706		
33514020	SANTIVANEZ JILL L		8026 S MAPLE	FRESNO CA 93725		
33513011S	SINGH SATWANT & HARJINDER K POONI		8061 S CEDAR	FRESNO CA 93725		
33404087U						
33501003U						
33514036U						
33517032	CEDAR AVENUE PROPERTIES LTD		8570 S CEDAR	FRESNO CA 93725		
33519011	LUTZ WILLIAM		7079 S CEDAR	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
33425044	YERGAT KIRK & KATHY		2121 E MORTON	FRESNO CA 93725		
33511017	GEJEIAN ALBERT & VIOLET TRUSTEES		1850 E SOUTH	FRESNO CA 93725		
33511039U						
33401001U						
33511011	PERON SUSAN L		7870 S MAPLE	FRESNO CA 93725		
33511041U						
33514034SU						
33425009	LUNA ANNIE	SERRANO ADRIAN & JULIE ANN	3083 E CORNELL	FRESNO CA 93703		
33431033	IM SOTAN & CHANSUNTHY TRUSTEES		1739 E MARKET ST	LONG BEACH CA 90805		
33519010	MILLER BILLY R & RUBY J TRUSTEES		7047 S CEDAR	FRESNO CA 93725		
33425021	YERGAT KIRK & KATHY TRUSTEES		2121 E MORTON	FRESNO CA 93725		
33404093S	GILL AVTAR		5626 S CEDAR	FRESNO CA 93725		
33425052	NIELSEN HOWARD W		2172 E MORTON AVE	FRESNO CA 93725		
33433039	GRAHAM JOHN O & BARBARA J TRUSTEES		1219 E AMERICAN	FRESNO CA 93725		
33433046S	GRAHAM JOHN O & BARBARA J TRUSTEES		1219 E AMERICAN	FRESNO CA 93725		
33021101	RACO KRISTI ANN		2093 E MALAGA	FRESNO CA 93725		
33021102	PADGETT WILLIAM WAYNE & LISA MARIE		2055 E MALAGA	FRESNO CA 93725		
33021104	RACO GARY DONALD & DEBRA KAY		2109 E MALAGA	FRESNO CA 93725		
33431051	OLSEN MILDRED A TRUSTEE		6241 N MONTANA	CLOVIS CA 93619		
33021222	SINGH PARAMJIT K		4323 W AMHERST	FRESNO CA 93722		
33433017	COSTALES BRIAN JAMES	COSTALES ELMER JOSEPH & RITA MARIE	5852 S CEDAR	FRESNO CA 93725		
33431055	SCHMALL KENNETH		5523 S PEACH	FRESNO CA 93725		
33511020	GENTLE WILLIAM R TRUSTEE		7818 S CHERRY	FRESNO CA 93725		
38502055S	SINGH MANDHIR & HARMINDER K TOOR	DHALIWAL HEMRAJ SINGH	P O BOX 458	FOWLER CA 93625		
38508113	CHAVEZ JORGE CAZARES		13230 S CHESTNUT	SELMA CA 93662		
38521022	NASH DAIRY CO		4225 E CONEJO	SELMA CA 93662		
38508121	ROGUE RAUL		2678 NECTARINE	SELMA CA 93662		
04219041S	SINGH PAUL & SWARANJIT KAUR TRUSTEES		7495 N VAN NESS	FRESNO CA 93711		
33519009	YAMAGIWA BETTY TRUSTEE		7025 S CEDAR	FRESNO CA 93725		
04216002	VASQUEZ ENRIQUE & MARIA TRUSTEES		7671 S ORANGE	FRESNO CA 93725		
04216020SU						

APN	Owner Name	Owner Name 2	Mailing Address			
33509003	PETERSEN PHYLLIS E TRUSTEE	WATKINS RHONDA TRUSTEE	2047 E ADAMS	FRESNO CA 93725		
33509002	MRO INVESTMENTS INC		8839 N CEDAR #12	FRESNO CA 93720		
33432030	KIGGENS DANIEL & MELISSA L		1801 E JEFFERSON	FRESNO CA 93725		
33432031	YOU KHLOEUNG & SOKHEMALY LENG		3067 N YALE WAY	HANFORD CA 93230		
38505103	MEDINA JOSE		12442 S CHESTNUT	FRESNO CA 93725		
38505104	BENAVIDEZ MARIA		12482 S CHESTNUT	FRESNO CA 93725		
04216006S	GONZALES ROSALIE TRUSTEE		5447 E AMERICAN	FRESNO CA 93725		
04216017S	GONZALES ROSALIE TRUSTEE		5447 E AMERICAN	FRESNO CA 93725		
33810027	ROBINSON WILLIE L & MARCELLA RUTH TRS		3238 E FLORAL	FRESNO CA 93725		
33810026U						
38521017	CHILINGERIAN INVESTMENTS LP		1310 S SIERRA VISTA	FRESNO CA 93702		
33811046S	MAHAL GURDEEP & CHARANJIT	MAHAL GURDEEP & CHARANJIT	1962 S JAMESON	FRESNO CA 93706		
04218007	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
04218002S	TILLER JERRY & BEATRICE TRUSTEES		2738 E ADAMS	FRESNO CA 93725		
04218004	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
33810028U						
38501001U						
33517025U						
33811035	POULSEN ALBERT & LORRAINE M	POULSEN BRUCE ARTHUR ETAL	P O BOX 668	KINGSBURG CA 93631		
33811052S	SIMONIAN PATRICIA M TRUSTEE	SIMONIAN HAROLD J & EDITH E TRUSTEES	8812 S FOWLER	FOWLER CA 93625		
33808019	RIVAS SANTOS SR	RIVAS SANTOS JR	5511 S MAPLE	FRESNO CA 93725		
33808012	HODGES WILLIE L & BEVERLY J		2125 E BOWLES AVE	FRESNO CA 93725		
38505114S	ERICKSON DEBBIE TRUSTEE		P O BOX 36	FOWLER CA 93625		
05609015S	JACKSON GEORGE & COLLEEN		P O BOX 456	KINGSBURG CA 93631		
38518062	ADAMS RICHARD		P O BOX 224	LATON CA 93242		
38514023S	INGOYEN JOSEPH	INGOYEN JULIAN ETAL	38588 ROAD 8	KINGSBURG CA 93631		
38518027	LEONARDO BROS DAIRY		16508 S CLOVIS	SELMA CA 93662		
38521020	LEE ONITA		15308 S TOPEKA	SELMA CA 93662		
38520012U						
38508129	ROMERO LUPE S & VERA TRUSTEES		1199 EVERGREEN	SELMA CA 93662		
38511071	BASRAON DARSHAN SINGH		1973 ALLUVIAL	CLOVIS CA 93611		

APN	Owner Name	Owner Name 2	Mailing Address			
38511006S	BASRAON DARSHAN SINGH		1973 ALLUVIAL	CLOVIS CA 93611		
38521015	COLLINS O L & NINA L		1319 ALMOND	SELMA CA 93662		
38521016	THRELKELD LULA L		15190 S TOPEKA AVE	SELMA CA 93662		
05602009S	MENEZES FRANK		20270 S CLOVIS	LATON CA 93242		
04219043S	SINGH PAUL & SWARANJIT KAUR TRUSTEES		7495 N VAN NESS	FRESNO CA 93711		
38517008	SECURITY PACIFIC NATIONAL BANK TR		% HARDING & CARBONE INC	3903 BELLAIRE BLVD	HOUSTON TX 77025	
38511038	EFIRD JACK R & SANDRA	EFIRD JACK TRUSTEE	15621 S CEDAR	FRESNO CA 93725		
38511057	IMPERIAL WESTERN PRODUCTS INC		P O BOX 1110	COACHELLA CA 92236		
38518028S	SIFUENTES GLORIA G		P O BOX 299	SELMA CA 93662		
38518029S	VELASCO ROSEMARY ORTEGA		2629 B	SELMA CA 93662		
38514017	CASACA VINEYARDS		P O BOX 216	FIVE POINTS CA 93624		
05603051S	THIESEN ELDON & YUKARI		1338 21ST	KINGSBURG CA 93631		
05603042S	RAVEN SCOTT		5700 E CLARKSON	SELMA CA 93662		
38508128	PULLINGER DEREK JAMES & ADORA TRUSTEES		13690 S CHESTNUT	SELMA CA 93662		
38501012S	CASACA VINEYARDS		P O BOX 216	FIVE POINTS CA 93624		
38520004	CUNNINGHAM REBECCA B	CUNNINGHAM ROBERT ET AL	616 N HARRISON AVE	FRESNO CA 93728		
05603038S	SIHOTA FAMILY PARTNERS LP		12174 S TEMPERANCE AVE	SELMA CA 93662		
38511048	GARCIA JUANA (ROJAS)	ROJAS JUANA	14464 S WILLOW	SELMA CA 93662		
38517047S	LEONARDO BROS DAIRY		16508 S CLOVIS AVE	SELMA CA 93662		
05609016S	JACKSON GEORGE & COLLEEN		P O BOX 456	KINGSBURG CA 93631		
38508125	LOPEZ JOSE	LOPEZ MIGUEL	2044 FRONT	SELMA CA 93662		
04229002S	SINGH PAUL & SWARANJIT KAUR TRUSTEES		7495 N VAN NESS	FRESNO CA 93711		
33021105	RACO LOIS M		2131 E MALAGA	FRESNO CA 93725		
05602064S	CROWELL MICHAEL V & JONETTE D		P O BOX 1005	TURLOCK CA 95381		
33021107	PALUMBO JANICE E TRUSTEE		5814 E HAMILTON	FRESNO CA 93727		
33516009	FOWLER PACKING CO INC		% M GOLBEK	8570 S CEDAR	FRESNO CA 93725	
48001029U	Burlington Northern & Santa Fe R.R.					
33811049U						
05609009	ANDRANIGIAN ASHOUN M & ROCHELLE REV TR		P O BOX 752	LATON CA 93242		
33021120	RACO SANDRA GAIL TRUSTEE		2235 E MALAGA	FRESNO CA 93725		
33021133	RACO FRED A & BARBARA JOAN		2093 E MALAGA	FRESNO CA 93725		
33811047	GONZALEZ RICARDO & MARIBEL F		2550 E FLORAL	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
33021108	BOWEN DANIEL E		4664 S CEDAR	FRESNO CA 93725		
48001030U	Burlington Northern & Santa Fe R.R.					
33432046	HULL CLAUDE DEAN SR & ARDISMAE TRUSTEES		5719 S CEDAR	FRESNO CA 93725		
33021123U						
33808025U						
33517029SU						
33433049U						
33432003	GILL ROOP SINGH & JAGREET K	GILL POONAM KAUR	776 JEFFERSON	FRESNO CA 93725		
38518031S	LEONARDO BROS DAIRY		16508 S CLOVIS	SELMA CA 93662		
33430048	SINGH SUKHWINDER & NEENA		5620 W RICHERT	FRESNO CA 93722		
05608012S	ANDRANIGIAN ASHOUN M & ROCHELLE REV TR		P O BOX 752	LATON CA 93242		
33514029	MARTHEDRAL JON & SANDRA		8180 S ORANGE	FRESNO CA 93725		
33519012	PERRY PAUL G JR	PERRY MARY LOU ET AL	7111 S CEDAR	FRESNO CA 93725		
38508118S	EADS EDGAR WAYNE		13251 S WILLOW	SELMA CA 93662		
38508101	PEN SOKHOM		208 N BLAKE ST	PINE BLUFF AR 71601		
33002111S	LOUIS DREYFUS COMMOD COTTON STORAGE LLC		40 DANBURY RD	WILTON CT 06897		
47810104	OCHOA ANDREW V JR		2155 S G	FRESNO CA 93721		
47816317	DILLDINE WAYMON W & BARBARA K TRS		6762 E BELMONT AVE	FRESNO CA 93727		
47822214	THOMAS THOMAS O & CINDY J	HARTER JOHN P & MARY ANN	8510 E ALLUVIAL	CLOVIS CA 93619		
48001007U	Union Pacific Railroad Co					
33003175	ELLIS DENNIS R	SCHNEIDER TIMOTHY G & SALLY BIANCO TRS	P O BOX 2668	FRESNO CA 93745		
48718012	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
48002076	BR PROPERTIES LLC		% J MOTE	P O BOX 2247	JONESBORO AZ 72402	
47914009	EVANSKI JOHN H		2476 S RAILROAD	FRESNO CA 93706		
47903076	SHUFELBERGER ALAN & SHERRY		PO BOX 990861	REDDING CA 96099		
47907228	SOLLEY ROB		2141 TUOLUMNE #J	FRESNO CA 93721		
47816318	HAMILTON WANDA JOAN TRUSTEE		6756 E LANE	FRESNO CA 93727		
48001001U	Union Pacific Railroad Co					
48018203	MYTYCH DIANE MADGE FISHER	MAGGY BRADLEY A	41150 DAWN	MADERA CA 93638		
47828407	MORNING SUNRISE HOSPITALITY INC		% M PATEL	P O BOX 1468	FRESNO CA 93716	
48001005U	Union Pacific Railroad Co					

APN	Owner Name	Owner Name 2	Mailing Address			
47810219T						
48718013	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
48718009	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
33002107	HOWARD REALTY COMPANY		P O BOX 12346	FRESNO CA 93777		
33006036S	LARGENT HARLAND M & BETTY		9888 HARVEY RD	GALT CA 95632		
48015411	ORIGEL JUAN F & BLANCA		2338 S EAST	FRESNO CA 93721		
47903074	SAN JOAQUIN STAIRS		2443 FOUNDARY PARK	FRESNO CA 93706		
48001006U	Union Pacific Railroad Co					
47829024	HUNSAKER SHIRLEY M TRUSTEE		P O BOX 12224	FRESNO CA 93777		
33006022S	PETERS RICHARD & BARBARA JEAN TRUSTEES		P O BOX 907	FRESNO CA 93714		
33013023	PARKER CRAIG W & LORI M		P O BOX 25247	FRESNO CA 93729		
48705075	D & P ENTERPRISES LLC	D & P ENTERPRISES LLC	2660 S RAILROAD	FRESNO CA 93725		
48702001U	Union Pacific Railroad Co					
48710034	COSSETTE INVESTMENT COMPANY INC		P O BOX 9354	FRESNO CA 93791		
47822210	NEW HORIZONS HOSPITALITY INCORPORATED		P O BOX 1468	FRESNO CA 93716		
47810217	VEGA MICHAEL A		2276 BROWNING	CLOVIS CA 93611		
48014004	ELECTRIC MOTOR SHOP INC		P O BOX 446	FRESNO CA 93709		
47907226S	WEIR FLOWAY INC		2494 S RAILROAD AVE	FRESNO CA 93706		
47810205	VEGA MICHAEL A	VEGA FRANCISCO J II ETAL	2276 BROWNING	CLOVIS CA 93611		
33006040ST	ST OF CA					
33006023S	PETERS RICHARD & BARBARA JEAN TRUSTEES		P O BOX 907	FRESNO CA 93714		
33003161S	JENSEN ROBERT V INC		P O BOX 12907	FRESNO CA 93779		
33003142S	SOUTHERN PACIFIC PIPE LINES		1100 TOWN & COUNTRY RD	#729A	ORANGE CA 92668	
47810216	VEGA MICHAEL A	VEGA FRANCISCO J II ETAL	2276 BROWNING	CLOVIS CA 93611		
47822213	WEST DANIEL		2310 S RAILROAD AVE	FRESNO CA 93721		
48018209	MARMOLEJO LARRY S		3827 E LIBERTY	FRESNO CA 93702		
46702042U						
46702029U						
47810218	YASIN GHASSAN		10655 N RECREATION	FRESNO CA 93730		
48015413	REYES LEONEL RODRIGUEZ		P O BOX 2567	FRESNO CA 93745		
47829003	CAMPOS VICTOR & CANDELARIA GODINEZ		3135 FINE	CLOVIS CA 93612		
47829001	ROGERS E WAYNE TRUSTEE	LINE JAMES TRUSTEE ET AL	%TURNING POINT FOUNDATION	P O BOX 7447	VISALIA CA 93277	

APN	Owner Name	Owner Name 2	Mailing Address			
48018215	VILLASENOR GABRIEL		6490 W MC KINLEY	FRESNO CA 93722		
47903071	U S BANK NATIONAL ASSOCIATION TRUSTEE		% OCWEN LOAN SRVC LLC	1661 WORTHINGTON RD #100	W PALM BEACH FL 33409	
48002065	TRANSFORM LTD		ATTN: A L JENNINGS	1800 NE BROADWAY AVE	DES MOINES IA 50313	
48036017U						
48013217	ELECTRIC MOTOR SHOP INC		P O BOX 446	FRESNO CA 93709		
33003171	CALAVERAS MATERIALS INC		% RYAN INC	ATTN K WEAVER	13155 NOEL RD #100	DALLAS TX 75240
47822215	THOMAS THOMAS OWEN TRUSTEE	THOMAS PATRICK STEWART TRUSTEE	8510 E ALLUVIAL	CLOVIS CA 93619		
48708065	PATEL NAGIN S & MADHU		2710 S ORANGE	FRESNO CA 93725		
48714052S	SEED SERVICES INC		ATTN R HARTMAN	2850 S GOLDEN STATE BLVD	FRESNO CA 93725	
48015409	ESPINOSA YOLANDA R TRUSTEE		5534 E KINGS CANYON #B	FRESNO CA 93727		
48718008	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
33003172	CALAVERAS MATERIALS INC		% RYAN INC	ATTN K WEAVER	13155 NOEL RD #100	DALLAS TX 75240
47911001	THERMO KING FRESNO INC		2410 S RAILROAD	FRESNO CA 93706		
48001013U						
48714024T	FRESNO IRRIG DIST					
47822209	LETIZIA JAMES V TRUSTEE	PADIA JANINE	P O BOX 70	SELMA CA 93662		
48018111	POVERELLO HOUSE		P O BOX 12225	FRESNO CA 93777		
48013221	CAGLIA FRANK S TRUSTEE		P O BOX 446	FRESNO CA 93709		
48718010	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
48714005T	FRESNO IRRIG DIST					
33003107S	BRANDT & SALMONSON LLC		P O BOX 35000	FRESNO CA 93745		
48710037	COSSETTE INVESTMENT CO		P O BOX 9354	FRESNO CA 93791		
48036016U						
48015407	BISUANO TONY & TRINI		2465 S SIERRA VISTA AVE	FRESNO CA 93725		
311040003	ROELOFFS JOHN W & MARJORIE L (TRS F		13508 RD 104	TIPTON CA 93272		
311040024	DELGADO MARY (EST OF)		C/O MARY SIMOES	29120 NO FENTEM RD	GUSTINE CA 95322	
311050006	WHITE RANCH LAND COMPANY LLC		2809 UNICORN RD STE 107	BAKERSFIELD CA 93308		
311050008	WHITE RANCH LAND COMPANY LLC		2809 UNICORN RD STE 107	BAKERSFIELD CA 93308		
200230002	SILVEIRA CRAIG		2143 N ADAMS	TULARE CA 93274		
291090013	SANDRIDGE PARTNERS LP		920 W FREMONT AVE	SUNNYVALE CA 94087		
291090014	CORCPORK COMPANY		500 NEWPORT CENTER DRIVE #910	NEWPORT BEACH CA 92660		

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APN	Owner Name	Owner Name 2	Mailing Address			
291100003	SANDRIDGE PARTNERS LP		920 W FREMONT AVE	SUNNYVALE CA 94087		
291020016	BOWMAN GLORIA JEAN(TR)(RESIDUAL TR)		1203 W HEMLOCK AVENUE	VISALIA CA 93277		
291030013	MORRIS PROCTOR INC		P O BOX 623	CORCORAN CA 93212		
291060001	VALOV JOHN F (TR)		18275 RD 28 APT B	TULARE CA 93274		
291060002	HANSEN PHILLIP W(TR)(SEP PROP TR)		C/O HANSEN RANCHES	P O BOX 398	CORCORAN CA 93212	
291060023	COOPER TIMOTHY J & BARBARA C (TRS)		P O BOX 25	CORCORAN CA 93212		
291070002	VALOV JOHN F (TR)		18275 RD 28 APT B	TULARE CA 93274		
291070008	BRECKENRIDGE MARY(TR)(BRECKENRIDGE		715 FAIRWAY DRIVE	BAKERSFIELD CA 93309		
291070010	SANDRIDGE PARTNERS LP		920 W FREMONT AVE	SUNNYVALE CA 94087		
291110003	SANDRIDGE PARTNERS LP		920 W FREMONT AVE	SUNNYVALE CA 94087		
311030009	SCHAKEL FAMILY PTNRS L P		P O BOX 1017	TIPTON CA 93272		
311080006	ALPAUGH IRRIGATION DISTRICT		PO BOX 129	ALPAUGH CA 93201-0129		
311080007	WHITE RANCH LAND COMPANY LLC		2809 UNICORN RD STE 107	BAKERSFIELD CA 93308		
313050009	SPS ALPAUGH 50 LLC (LSE)		C/O GCL SOLAR ENERGY INC	ONE MRKT PLAZA STEUART TWR1800	SAN FRANCISCO CA 94105	
313050010	ALPAUGH IRRIGATION DISTRICT		PO BOX 129	ALPAUGH CA 93201-0129		
313060002	SPS ALPAUGH 50 LLC (LSE)		C/O GCL SOLAR ENERGY INC	ONE MRKT PLAZA STEUART TWR1800	SAN FRANCISCO CA 94105	
313080002	ATWELL ISLAND WATER DISTRICT		P O BOX 220	ALPAUGH CA 93201		
333101007	GAHVEJIAN JOHN & LORETTA R		1740 S CLAREMONT	FRESNO CA 93727		
333101008	BROWN FORREST C		9 INWOOD POINT DR	SAN ANTONIO TX 78248-1647		
333065004	SALVATION ARMY THE		C/O LEGAL DEPT-SC SECTION	180 E OCEAN BOULEVARD 9TH FLR	LONG BEACH CA 90802	
333065005	CALLAN THOMAS J & GLADYS ANN (TR)		2790 JUNIPERO SERRA BLVD	DALY CITY CA 94015		
333065022	MIMS RUTH L		583 IRENE DR	CANYON LAKE TX 78133		
333065023	MANSTON GREGG		PO BOX 343	CLAREMONT CA 91711		
333065027	MANSTON GREGG		PO BOX 343	CLAREMONT CA 91711		
333065042	FOSTER PARKER V JR		7620 PALMILLA DR #67	SAN DIEGO CA 92122		
333065043	JCH FAMILY LIMITED PTNSHP		5917 W ELOWIN DR	VISALIA CA 93291		
333101064	HAYES ALBERT E ET UX		C/O THELMA R GORDON	747 A NORTH STREET	YREKA CA 96097	
333103061	SPEIGHT JOHN C (TR)		410 HILLSDALE DRIVE	SANTA ROSA CA 95409-6109		
333103062	JANSKY DANIEL (EST OF)		17880 TOIYABE ST	FOUNTAIN VALLEY CA 92708		

APN	Owner Name	Owner Name 2	Mailing Address			
333110005	JOHN HANCOCK LIFE INS CO (USA)		301 E MAIN ST	TURLOCK CA 95380		
333110007	JOHN HANCOCK LIFE INS CO (USA)		301 E MAIN ST	TURLOCK CA 95380		
333120001	REEDY ASHOKA MALLADI		2398 BAY CREST DR	HOUSTON TX 77058		
333130004	TANZOLA JAMES A JR		C/O CAROLYN TANZOLA	6451 FIREBRAND ST	LOS ANGELES CA 90045	
333130006	BONESTEEL MICHEL J (TR)		13688 W SUNSET BLVD	PACIFIC PALISADES CA 90272		
333140012	TANZOLA JAMES A JR		C/O CAROLYN TANZOLA	6451 FIREBRAND ST	LOS ANGELES CA 90045	
333150001	PHILLIPS JACK C & DORIS M (CO-TRS)		P O BOX 548	DELANO CA 93216-0548		
333370011	WELLS WALTER A (EST OF)		C/O BETHANY SAVANNAH-HOGGRO	17615 W CARIBBEAN LN	SURPRISE AZ 85388	
333370012	JCP RANCH PROPERTIES INC		P O BOX 548	DELANO CA 93216		
333370013	JCP RANCH PROPERTIES INC		P O BOX 548	DELANO CA 93216		
888888888						
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002200040000	ESAJIAN, GARY E & ELENE P FAMILY TRUST		P O BOX 550	KINGSBURG CA 93631		
002200032000	ROSA, MIKE J TESTAMENTARY TRUST		C/O ANGIE ROSA	2475 FAIRMONT DR	HANFORD CA 93230-6803	
002190001000	VIERRA, HELEN K ESTATE		P O BOX 132	HANFORD CA 93230-0132		
002190002000	VIERRA, HELEN K ESTATE		P O BOX 132	HANFORD CA 93232		
002160004000	JOHNS, HUGH V INC		3885 8TH AVE	HANFORD CA 93230		
002150068000	TOS, JOHN W & VICTORIA F LIV TRUST 50%		5081 15 1/2 AVE	HANFORD CA 93230		
002150027000	OLIVEIRA, LOUIS R 1.5%		C/O ELSIE OLIVEIRA	2033 FRANKLIN WY	HANFORD CA 93230	
002150022000	JOHNS, BRAD V		3885 8TH AVE	HANFORD CA 93230		
002150057000	TOS, WILLIAM JR & LINDA LIVING TRUST 50%		9240 EXCELSIOR AVE	HANFORD CA 93230		
002150050000	OLIVEIRA, LOUIS R FAMILY TRUST		14253 LACEY BLVD	HANFORD CA 93230		
002150069000	DE ROSA, GIZELA FAMILY TRUST		8084 DOVER AVE	HANFORD CA 93230		
002120050000	STOUT, RONALD & PAMELA TRUST		2004 9TH AVE	LATON CA 93242		
002120031000	CRAWSHAW, STANLEY A 33.33%		8704 CAIRO AVE	LATON CA 93242		
002120034000	MURADIAN, LEM & BETTY R TRUST A		13063 S ACADEMY	KINGSBURG CA 93631		

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002190009000	OLIVEIRA, LOUIS R 25%		C/O MEL FARMS	14253 LACEY BLVD	HANFORD CA 93230	
014390011000	GEAR, TYE J & JESSICA L H/W		7456 LACEY BLVD	HANFORD CA 93230		
014390012000	DOWNING, MILLARD & MINNIE H/W		9944 PONDEROSA ST	HANFORD CA 93230		
014390013000	CARLSON, ELIZA		833 E FLORINDA ST	HANFORD CA 93230		
014390014000	MARROQUIN, HECTOR C		9844 PONDEROSA ST	HANFORD CA 93230		
014390017000	FUKUDA, AARON K		7450 MOUNTAIN VIEW ST	HANFORD CA 93230		
014260094000	DIAS, MICHAEL A & GERMAINE FIRST AMENDED		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014260077000	SINGH, DALJIT 50%		1121 PISTACHE AVE	LEMOORE CA 93245		
014260078000	EBC FARMS LLC		27887 JACKSON AVE	LEMOORE CA 93245		
014260029000	GALES, HELEN M		8030 7 1/2 AVE	HANFORD CA 93230		
014260100000	RICHARDS FAMILY LAND LLC		C/O FRANK L RICHARDS MANAGER	39 SOUTHEAST 6TH ST	LAWTON OK 73501	
014251049000	HELENA CHEMICAL CO		225 SCHILLING BLVD STE 300	COLLIERVILLE TN 38017		
014251050000	HELENA CHEMICAL COMPANY		225 SCHILLING BLVD STE 300	COLLIERVILLE TN 38017		
014251046000	BADYAL, RAVINDER 50%		12219 E ROSE AVE	SELMA CA 93662		
014251009000	ARCHER, ROBERT C & MARY E H/W		8408 E LACEY BLVD	HANFORD CA 93230		
014251042000	PINNACLE POINTE LLC		5 RIVER PARK PL E STE 102	FRESNO CA 93720		
014251023000	KINGS S P C A, INC		8084 LACEY BLVD	HANFORD CA 93230		
014241007000	HANFORD JOINT UNION HIGH SCHOOL DISTRICT		120 E GRANGEVILLE BLVD	HANFORD CA 93230		
014242045000	HAMBLIN, CHARLES & MARGARET LIV TRUST		7286 E LACEY BLVD	HANFORD CA 93230		
014241001000	LACEY COURTS MHP LLC		1075 SPACE PARK WAY SP 298	MOUNTAIN VIEW CA 94043		
014241002000	BADASCI FAMILY TRUST BYPAS TRUST		C/O HELEN BADASCI HERZOG	5441 N PLEASANT AVE	FRESNO CA 93711	
014242027000	MATHIS, LYNNE		9994 COAST AVE	HANFORD CA 93230		
014230060000	CITY OF HANFORD		900 S 10TH AVE	HANFORD CA 93230		
014230023000	FAUSETT, LEE & PAULA FAMILY TRUST		P O BOX 1758	HANFORD CA 93232		
014230064000	MENDES, CARL J & KAREN M H/W		9516 8TH AVE	HANFORD CA 93230		
014130071000	DIAS, MICHAEL A & G FIRST AMENDED TRUST		7696 GRANGEVILLE BLVD	HANFORD CA 93230		
014130087000	ROGERS, JAMES W IRREVOCABLE LIVING TRUST		C/O MANUEL W ROGERS TRS	P O BOX 1579	HANFORD CA 93232	
014130084000	STRONG, MARTIN		8509 7 1/2 AVE	HANFORD CA 93230		
014130086000	ROGERS, JAMES W IRREVOCABLE LIVING TRUST		C/O MANUEL W ROGERS TRS	P O BOX 1579	HANFORD CA 93232	
014130085000	ROGERS, JAMES W IRREVOCABLE LIVING TRUST		C/O MANUEL W ROGERS TRS	P O BOX 1579	HANFORD CA 93232	
014130007000	SILVA, JOE R TESTAMENTARY TRUST		C/O FRANCES D SILVA	645 C ST	LEMOORE CA 93245	
014090034000	BARCELLOS, DEAN & RENEE LIVING TRUST 50%		3480 N CHAPARRAL CT	HANFORD CA 93230		

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014090042000	SILVA, BRIAN M		901 W PEBBLE DR	HANFORD CA 93230		
014090022000	TEIXEIRA, JOHN FARMS INC		8290 FLINT AVE	HANFORD CA 93230		
014060049000	MC CUTCHEON, BARRY H & BRENDA FAM TRUST		7543 ELDER AVE	HANFORD CA 93230		
014060022000	FELIPE FAMILY TRUST		6520 7TH AVE	HANFORD CA 93230		
014060006000	BARCELLOS, DEAN & RENEE LIVING TRUST 50%		3480 N CHAPARRAL CT	HANFORD CA 93230		
014060033000	PEOPLES DITCH CO		C/O JAMES G MC CAIN	P O BOX 1261	HANFORD CA 93232	
014020020000	GARNER, JOHN G REV TRUST		7930 ELDER AVE	HANFORD CA 93230		
014020016000	BETTENCOURT, JOHN S LIVING TRUST		3991 N 10TH AVE	HANFORD CA 93230		
014020001000	BARCELLOS, ANTONIO L JR & MARY J H/W		5320 EXCELSIOR AVE	HANFORD CA 93230		
014020019000	GARNER, JOHN G REV TRUST		7930 ELDER AVE	HANFORD CA 93230		
014010065000	BARCELLOS, ANTONIO L JR & MARY J H/W		5320 EXCELSIOR AVE	HANFORD CA 93230		
016260019000	BRAZIL, TONY J & VIRGINIA L REVOC LVG TR		13419 7TH AVE	HANFORD CA 93230		
016200011000	MARTELLA, ROBIN W REVOCABLE TRUST		P O BOX 7687	VISALIA CA 93290		
016130084000	CHAMPLIN, WESLEY & JOAN R H/W		509 E GRANGEVILLE BLVD	HANFORD CA 93230		
016130080000	KOSTER FAMILY REVOCABLE TRUST		1629 S JACQUES CT	VISALIA CA 93277		
016130079000	KOSTER FAMILY REV TRUST		1629 S JACQUES CT	VISALIA CA 93277		
016130067000	COUNTY OF KINGS		1400 W LACEY BLVD	HANFORD CA 93230		
016130058000	LEAL, DANIEL & BELLE LIVING TRUST		6236 HANFORD-ARMONA RD	HANFORD CA 93230		
016130055000	TRI WEST INVESTMENTS LLC		10431 8 3/4 AVE	HANFORD CA 93230		
016130078000	MURRIN FAMILY LIVING TRUST		C/O HAROLD A JAMES	801 BEATRICE DR	TULARE CA 93274	
016130054000	BETTENCOURT, M L EST		C/O TED BETTENCOURT	2353 MICHAEL WAY	HANFORD CA 93230	
016130034000	SOSA, RAMIRO R & ESTELA C H/W 50%		7257 E HANFORD-ARMONA RD	HANFORD CA 93230		
016070012000	BAKER RENDERING CORP		4020 BANDINI BLVD	VERNON CA 90058		
016070013000	BAKER RENDERING CORP		ATTN CARL BACLIT	4020 BANDINI BLVD	VERNON CA 90058	
016060021000	PINNACLE POINTE LLC		C/O RICK TELEGAN	5 RIVER PARK PL E STE 102	FRESNO CA 93720	
016060043000	VERDEGAAL BROS A PTP		13555 S 11TH AVE	HANFORD CA 93230		
016060027000	JESPERSEN, CHARLENE REVOCABLE TRUST THE		8967 E LACEY BLVD	HANFORD CA 93230		
016052029000	PATEL, SURYAKANT S		8595 E LACEY BLVD	HANFORD CA 93230		
016052007000	ALCALA, ANTONIO JR & EUNICE H/W		18266 GRANGEVILLE BLVD	LEMOORE CA 93245		
016052008000	ALCALA, ANTONIO JR & EUNICE H/W		18266 GRANGEVILLE BLVD	LEMOORE CA 93245		
016052030000	LOPEZ, JOSEPH REV LIVING TRUST		10933 MALTA ST	HANFORD CA 93230		
016052009000	ALCALA, ANTONIO JR & EUNICE H/W		18266 GRANGEVILLE BLVD	LEMOORE CA 93245		

APN	Owner Name	Owner Name 2	Mailing Address			
016051001000	PATEL, JAGDISH & HANSA H/W		8749 E LACEY BLVD	HANFORD CA 93230		
016052012000	ALCALA, ANTONIO JR & EUNICE H/W		18266 GRANGEVILLE BLVD	LEMOORE CA 93245		
016042057000	AVILA, RICHARD J & SUSAN J H/W TC		1316 N IRWIN ST	HANFORD CA 93230		
016042058000	HASTIN, DARLYNE M LIVING TRUST		440 JACKSON AVE	TULARE CA 93274		
028290014000	CORCORAN IRRIGATION DISTRICT		UNKNOWN			
028290018000	CORCORAN IRRIGATION DISTRICT		1150 6 1/2 AVE	CORCORAN CA 93212		
028290011000	CORCORAN IRRIGATION DISTRICT		1150 6 1/2 AVE	CORCORAN CA 93212		
028290008000	CROWN CASTLE GT COMPANY LLC		PMB353	4017 WASHINGTON RD	MC MURRAY PA 15317-2520	
028260030000	TURNER, A WAYNE & BETTY J TRUST 89.55%		2840 IRONWOOD	MORRO BAY CA 93442		
028260005000	LANSING LLC		7905 KANSAS AVE	HANFORD CA 93230		
028202007000	MATTOS, TONY JR		8480 KANSAS AVE	HANFORD CA 93230		
028205004000	MACHADO, TONY G 16.66%		8800 LANSING AVE	HANFORD CA 93230		
028202002000	VALADAO DAIRY A PTP		17293 9 1/2 AVE	HANFORD CA 93230		
028206015000	VALADAO DAIRY A GNL PTP		17293 9 1/2 AVE	HANFORD CA 93230		
028160031000	MONTEIRO, MICHAEL M & ANNA M TRUST 45%		3515 AVE 228	TULARE CA 93274		
028160027000	MONTEIRO, MICHAEL M & ANNA M TRUST 45%		999 ELSTER AVE	TULARE CA 93274		
028160022000	SMITH, JACK S		8521 JERSEY AVE	HANFORD CA 93230		
028080014000	MELGA CANAL CO		P O BOX 877	CORCORAN CA 93212		
028080001000	BRAZIL, ROBERT E REV TRUST		C/O BRAZIL, ROBERT E	13266 7TH AVE	HANFORD CA 93230	
028080002000	BERGMAN, BRIAN J & REANNA J H/W		7577 JACKSON AVE	HANFORD CA 93230		
028050020000	TOLEDO, JOHN & KELLI H/W 44%		29802 ROAD 44	VISALIA CA 93291		
028050019000	TON, JOHN B & RACHAEL A H/W		7025 IDAHO AVE	HANFORD CA 93230		
034230037000	BOYETT FARMS		P O BOX 386	CORCORAN CA 93212		
034230043000	SALYER LAND CO		P O BOX 488	CORCORAN CA 93212		
034160025000	CRISP, OLETA M		455 ORANGE AVE	CORCORAN CA 93212		
034080018000	BECERRA, REBECCA		5614 NEWARK AVE	CORCORAN CA 93212		
034080017000	GOMEZ, JESUS M & RAQUEL R H/W		P O BOX 1322	CORCORAN CA 93212		
034070012000	CEJA, ALFREDO JR 50%		5665 NEWARK AVE	CORCORAN CA 93212		
034070004000	PEREZ, ELIAS C & LUCIA H/W		5635 NEWARK AVE	CORCORAN CA 93212		
034060018000	CORCORAN HOLDINGS COMPANY LLC		P O BOX 2344	MERCED CA 95344		
034030012000	DAVIS, MARGARET S		5774 WAUKENA AVE	CORCORAN CA 93212		
034015008000	PACIFIC GAS & ELECTRIC CO		UNKNOWN			

APN	Owner Name	Owner Name 2	Mailing Address			
034012006000	FULLER, KAREN M 55%		5706 AVE 224	TULARE CA 93274		
034011013000	GEORGE, ELVIN G 50%		P O BOX 1186	CORCORAN CA 93212		
034015019000	CRAVENS, BRAD J & SIOBHAN LE MAY H/W		212 CAMPBELL CT	TULARE CA 93274		
034011005000	JIMENEZ, MA ELENA		2203 GARVEY AVE	CORCORAN CA 93212		
026010140	GARGAN J&K FAMILY TRUST	GARGAN JOHN M & KATHY A TRS	18251 JOHNSON RD	BAKERSFIELD CA 93314		
026010165	A T & S F R R		5200 E SHIELA ST	LOS ANGELES CA 90040		
026010173	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
026010264	WILSON STANLEY & NANCY REV TR		PO BOX 817	SHAFTER CA 93263		
026040030	BOWEN ROSS		741 W 129TH ST	GARDENA CA 90247		
027070234	MILLWEE JEFFREY RYAN	RICHLAND CHEVROLET CO	511 CENTRAL AV	SHAFTER CA 93263		
027030097	SILL PROPERTIES INC		1508 18TH ST	BAKERSFIELD CA 933014429	# 320	
027070366	BURLINGTON NORTHERN & SANTA FE RW CO		2500 LOU MENK DR	FT WORTH TX 76131		
027070374	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028082154	RKGL WIENS FAMILY PTP		29922 W LOS ANGELES ST	SHAFTER CA 93263		
028180271	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028180289	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028180586	CRAFT CHRIS & CAPPIE		1103 33RD ST	BAKERSFIELD CA 93301		
028190064	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030020010	HOKIT BILLY		1720 PRIMROSE CT	WASCO CA 93280		
030020028	HOKIT BILLY		1720 PRIMROSE CT	WASCO CA 93280		
030042014	CERTIS U S A LLC		9145 GUILFORD RD	COLUMBIA MD 21046	STE 175	
030052021	CERTIS U S A LLC	LEE TERRANCE CONTROLLER	9145 GUILFORD RD	COLUMBIA MD 21046	STE 175	
030062020	HAMILTON CAROL V		8801 SHORE VIEW DR	BAKERSFIELD CA 93312		
030062053	GROOMAN CHET A & RACHEL D		635 G ST	WASCO CA 93280		
030072037	CITY OF WASCO	PENNELL LARRY CITY MANAGER	P O BOX 836	WASCO CA 93280		
030072045	CITY OF WASCO	PENNELL LARRY CITY MANAGER	P O BOX 836	WASCO CA 93280		
030092035	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030192017	LUCIO HAY CO		10810 AVENUE 184	TULARE CA 93274		
030192033	BLOEMHOF AG ENTERPRISES		P O BOX 747	WASCO CA 93280		
030192066	BLOEMHOF AG ENTERPRISES		P O BOX 747	WASCO CA 93280		
030210066	BLOEMHOF AG ENTERPRISES		P O BOX 747	WASCO CA 93280		

APN	Owner Name	Owner Name 2	Mailing Address			
030422018	GARCIA RAFAEL		1233 G ST	WASCO CA 93280		
030436034	WESTERN AG INV INC		116 ANNIN	WASCO CA 93280		
030436042	WESTERN AG INV INC		116 ANNIN	WASCO CA 93280		
030436059	WESTERN AG INV INC		116 ANNIN	WASCO CA 93280		
030436067	ROCHA MARIA GUADALUPE		401 F ST	WASCO CA 93280		
030441026	CAMPOS GUILLERMO & MARIA E		17893 LEONARD AV	SHAFTER CA 93263		
030441034	CAMPOS GUILLERMO & MARIA E		17893 LEONARD AV	SHAFTER CA 93263		
030441109	CRAIG HARLEY FMLY TR		916 OAK ST	WASCO CA 93280		
047120159	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130018	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130026	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130042	GRAYSON H V	GRAYSON MARGUERITE	5026 MILISSI WY	OCEANSIDE CA 92056		
047130059	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130067	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130075	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130083	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130224	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047040043	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047050042	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047050059	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047050067	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110127	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110135	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120019	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120027	TE VELDE DAVID & ALICE REV FMLY TR		5985 4TH AV	HANFORD CA 93230		
047190012	POND RANCH LLC		7616 N MONTE AV	FRESNO CA 93711		
047190020	POND RANCH LLC		7616 N MONTE AV	FRESNO CA 93711		
047200217	SAMARIN HARRY P REV TR		6225 RIDGETOP TR	BAKERSFIELD CA 93306		
047220025	POND POSO IMPROVEMENT DIST		P O BOX Z	WASCO CA 93280		
047220033	SHARMA RAVIN R & PUSHPA W		1101 PAJARO ST	SALINAS CA 93901		
047220124	IEZZA TONY JR & MARIA		1143 NORTON AV	GLENDALE CA 91202		
047220132	HOENES ROBERT N	SCHAEFER EDWARD & PATRICIA	11120 S BIRCH ST	JENKS OK 74037		

APN	Owner Name	Owner Name 2	Mailing Address			
047260195	SECTION 26 ALMOND ORCHARD LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
047260203	SECTION 26 ALMOND ORCHARD LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
047260211	SECTION 26 ALMOND ORCHARD LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
047260229	SECTION 26 ALMOND ORCHARD LLC		4200 TRUXTUN AV	BAKERSFIELD CA 93309	STE 101	
047350061	PREMIERE AGRICULTURAL PROP LLC		2004 FOX DR	CHAMPAIGN IL 61820	STE L	
047350087	JOHN HANCOCK MUTUAL LIFE INS CO		301 E MAIN ST	TURLOCK CA 953804537		
059280263	DEMLER MARY K		P O BOX 207	WASCO CA 932800207		
059280271	DEMLER MARY K		P O BOX 207	WASCO CA 932800207		
060140324	FANUCCHI FRANK M & JUDITH A		2302 EDINGAL DR	BAKERSFIELD CA 933118549		
059251132	HETTINGA STEVEN D & ARLENE A		P O BOX 809	PIXLEY CA 93256		
059251140	HETTINGA STEVEN D & ARLENE A		P O BOX 809	PIXLEY CA 93256		
059251157	HETTINGA STEVEN D & ARLENE A		P O BOX 809	PIXLEY CA 93256		
059251173	NORM PRESSLEYS TRUCK CENTER		3390 LILAC SUMMIT	ENCINITAS CA 92024		
071060164	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
072050123	MERZ FARMS INC		29364 HWY 46	WASCO CA 93280		
072050149	PACIFIC GAS & ELECTRIC CO		P O BOX 770000	SAN FRANCISCO CA 94177		
072060288	MARTIN JOHN H REV TR		1316 J ST	WASCO CA 93280		
072110133	MELVIN M MC CONNELL FARMS		P O BOX M	WASCO CA 93280		
072110174	MELVIN M MC CONNELL FARMS		P O BOX M	WASCO CA 93280		
072110182	MELVIN M MC CONNELL FARMS		P O BOX M	WASCO CA 93280		
072120041	WASCO REAL PROPERTIES II LLC		P O BOX 1200	WASCO CA 93280		
072120058	BOZARTH JERRY D		16202 WASCO AV	WASCO CA 93280		
072120066	SCHROEDER BEN J & YVETTE D	DOUDNEY DOUG	1443 BUCKWOOD DR	ORLANDO FL 32806		
072120108	A T & S F R R		5200 E SHIELA ST	LOS ANGELES CA 90040		
072170178	HANDEL GLENN H TR		P O BOX 609	SHAFTER CA 932630609		
072170186	TREEHOUSE CAL ALMONDS LLC		PO BOX 64489	LOS ANGELES CA 900640489		
072170293	DANIEL CARL R & PATRICIA A FMLY TR		16201 JOHNSON RD	BAKERSFIELD CA 93314		
072180151	NIKKEL FAMILY LTD PTP		P O BOX 593	LOS OLIVOS CA 93441		
072180193	FAMILY TREE FARMS LLC		11721 STINE RD	BAKERSFIELD CA 93313		
072180201	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
089020036	POPLAR FARMS INC	SHAFTER-WASCO GINNING CO INC	PO BOX 1567	SHAFTER CA 932631567		

APN	Owner Name	Owner Name 2	Mailing Address			
089020507	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
089030035	TWINKLE TRUST	STARRH FRED L JR TRS	1280 N POPLAR AV	SHAFTER CA 93263		
089040034	STARRH FRED L ET AL		P O BOX 1537	SHAFTER CA 932631537		
089040042	STARRH FRED L ET AL		P O BOX 1537	SHAFTER CA 932631537		
089070262	SHAFTER WASCO GINNING CO INC		PO BOX 1567	SHAFTER CA 932631567		
089070270	SHAFTER WASCO GINNING CO INC		PO BOX 1567	SHAFTER CA 932631567		
089150148	FRESHMAN S & A FAMILY TRUST	STANDARD MGMT CO	6151 W CENTURY BL	LOS ANGELES CA 90045	# 300	
089150213	WILBUR ELLIS CO		16300 CHRISTENSEN RD	SEATTLE WA 93188	# 135	
089150221	NMK ENTERPRISES LLC		1910 E LATHROP RD	LATHROP CA 95330		
090010109	A T & S F R R		5200 E SHIELA ST	LOS ANGELES CA 90040		
090010117	PUBLIC CEMETERY DIST NO 1		UNKNOWN	CA		
090010265	PUBLIC CEMETERY DISTRICT 1 OF KERN CO		PO BOX 354	SHAFTER CA 93263		
090010273	FARMLAND RESERVE INC	TAX ADM DIV 536-6224	PO BOX 511196	SALT LAKE CITY UT 841511196		
090180019	LENORA RANCH		P O BOX 699	SHAFTER CA 932630699		
090180027	SANDRIDGE PARTNERS		920 W FREMONT AV	SUNNYVALE CA 94087		
090180290	SHAFTER CITY OF		336 PACIFIC AV	SHAFTER CA 93263		
090180308	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
090180316	BNSF RY CO		BOX 961089	FORT WORTH TX 761610089		
090250333	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091270264	CARRILLO JOSE J & MARIA		5522 MILAGRO DR	BAKERSFIELD CA 93307		
091270272	MARTINEZ FRED C		3410 GEORGE ST	OXNARD CA 93036		
091280057	HOUSTON NATHANIEL & BERTHA		19423 SANTA FE WY	SHAFTER CA 932639608		
091280065	YAMAMOTO PAUL		766 ILANIWAI	HONOLULA HI 96813		
091280073	STAFFERO MANUEL & SANDRA		4604 SCALLOWAY CT	BAKERSFIELD CA 93312		
091280081	MARTELLO JOSEPH C & TAMARA L		5306 BANNING ST	BAKERSFIELD CA 93314		
091280099	BARTLETT LARRY E & CONNIE		34357 MERCED AV	BAKERSFIELD CA 933089523		
091252072	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091252080	WEIDENBACH MARVIN & RUTH SURVIVORS TRUST	WEIDENBACH RUTH A TRS	115 STOCKDALE CI	BAKERSFIELD CA 93309		
091252098	WEIDENBACH MARVIN & RUTH SURVIVORS TRUST	WEIDENBACH RUTH A TRS	115 STOCKDALE CI	BAKERSFIELD CA 93309		
091270082	DEASON FARON O & KATHERINE J		32173 LORAINE DR	SHAFTER CA 93263		
091270090	FREIDT ROBERT J & EVELYN		14104 SAN JOSE AV	BAKERSFIELD CA 93314		

APN	Owner Name	Owner Name 2	Mailing Address			
091270157	TURNEY JOE P & SUSAN M		32180 7TH STANDARD RD	SHAFTER CA 932639772		
091270173	PLASCENCIA MARISELA		4344 NOBLE ST	BAKERSFIELD CA 93312		
091270181	SHETTERS JIMMIE LEE		17611 BRIMHALL RD	BAKERSFIELD CA 933148905		
487010332	A T & SF RR					
487010605	TOWNSEND ALAN & JULIE O FAM TR	TOWNSEND ALAN & JULIE O TRS	14816 GRIFFITH AV	WASCO CA 93280		
487250045	WASCO CITY OF		PO BOX 728	WASCO CA 93280		
487250128	SUNNYGEM LLC		500 N F ST	WASCO CA 93280		
487250136	SUNNYGEM LLC		500 N F ST	WASCO CA 93280		
487250250	SANMOR ENTERPRISES INC		450 N F ST	WASCO CA 93280		
489041020	PORTER KENNETH I & SHEILA M		1025 ROSEWOOD AV	WASCO CA 93280		
489041038	PORTER KENNETH I & SHEILA M		1025 ROSEWOOD AV	WASCO CA 93280		
489041046	WEGMAN CHARLES P & CHERYLEE ET AL		1848 G ST	WASCO CA 93280		
489041053	WEGMAN CHARLES P & CHERYLEE ET AL		1848 G ST	WASCO CA 93280		
489020164	VINTAGE NURSERIES LLC	CHIEF EXECUTIVE OFFICER	27920 MC COMBS AV	WASCO CA 93280	BOX 279	
489020172	VINTAGE NURSERIES LLC	CHIEF EXECUTIVE OFFICER	27920 MC COMBS AV	WASCO CA 93280	BOX 279	
489020180	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
489020313	NEWMAN PATRICK & TERRY	.	13824 SEARSPOINT AV	BAKERSFIELD CA 933148333		
489041087	WHITE BRENDA L LIVING TR		6309 VERDUN AV	LOS ANGELES CA 90043		
48001015U						
33425010	RIVAS SANTOS & SOFIA		5511 S MAPLE	FRESNO CA 93725		
33425002	LAZARUS NICHOLAS & KAREN CARLENE TRS		5841 S MAPLE	FRESNO CA 93725		
33435057	HARTWIG KENNETH R & BETTY A		5379 S CEDAR	FRESNO CA 93725		
33511036SU						
33808022U						
33817003	ESPARZA LEO J & BERTHA JOAN C/F DVA		9025 S CHANCE	FRESNO CA 93725		
33509047	KAZARIAN NICK C & LORRAINE M TRUSTEES		5648 COLUMBIA N	FRESNO CA 93727		
33517027SU						
04201004U	Burlington Northern & Santa Fe R.R.					
33807015	SETO JERRY M & NANCY		6730 N DURANT	FRESNO CA 93711		
33808021	SINGH AMARJIT & PARWINDER KAUR		2419 E MANNING	FRESNO CA 93725		
33514030	CEDAR AVENUE PROPERTIES LTD		8570 S CEDAR	FRESNO CA 93725		

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33425039	YERGAT KIRK & KATHY TRUSTEES		2121 E MORTON	FRESNO CA 93725		
33808003	GONZALES ROSALIE TRUSTEE		5447 E AMERICAN	FRESNO CA 93727		
33511035S	ROCCA STEVEN JOHN		7549 S MAPLE	FRESNO CA 93725		
33514033U						
33404080	SIDHU KARNAIL SINGH & MANJIT K TRS	ROMANA SUKHJINDER TRUSTEE	6803 W OSWEGO	FRESNO CA 93722		
33435039	BAL SARBJIT SINGH		2240 N BLACKSTONE	FRESNO CA 93703		
33404088	SHAHBAZIAN GARY K		5067 S MAPLE	FRESNO CA 93725		
33522004	YBARRA ROSIE FLORES	YBARRA LUPE FLORES	2048 E MANNING	FRESNO CA 93725		
33522017	CHRISTENSEN STEPHEN	CHRISTENSEN LA CHRIS A	65 CLARK ST	SALINAS CA 93901		
33522010	ESPARZA DELLA TRUSTEE		2168 E MANNING AVE	FRESNO CA 93725		
33514035S	RUIZ STELLA TRUSTEE		7299 S EAST	FRESNO CA 93725		
33425038	YERGAT KIRK & KATHY J		2199 E MORTON	FRESNO CA 93725		
33425045	YERGAT KIRK & KATHY TRUSTEES		2121 E MORTON	FRESNO CA 93725		
33509042	MARQUEZ NOE & ANGELA		7062 S MAPLE	FRESNO CA 93725		
33509028	URIBE VIDAL E & MARIA R		5797 S LILY	FRESNO CA 93706		
33519016	GUTIERREZ JOSE		1919 E ADAMS	FRESNO CA 93725		
33509001	RICCARDO THOMAS & ALETHEIA		7012 S CEDAR	FRESNO CA 93725		
33511042	ROBBINS BRENDA G		7887 S MAPLE	FRESNO CA 93725		
33517030S	SMITH GLENN A & BARBARA L TRUSTEES		8506 S MAPLE	FRESNO CA 93725		
33509061	CSER JOHN & MARGIE		3079 E SAMPLE	FRESNO CA 93710		
33509060U						
33433040	LAZARUS RICHARD TRUSTEE		P O BOX 2831	FRESNO CA 93745		
33435013S	EMERZIAN JERRY A & ROSALYN S TRUSTEES		1055 N VAN NESS C-2	FRESNO CA 93728		
33435059	PEN SOKHOM TRUSTEE		208 N BLAKE ST	PINE BLUFF AR 71601		
33404081	POONI HARJINDER K		8061 S CEDAR	FRESNO CA 93725		
33433007	JOHNS JEFFREY JAY & AMALIA		2502 E LINCOLN	FRESNO CA 93725		
33401002U						
33432014	MELODY LIMITED PARTNERSHIP		% J MARKARIAN	5551 S ORANGE	FRESNO CA 93725	
33433048	BAKHSHISH SINGH & GRANDSONS LLC		% A GILL	5626 S CEDAR	FRESNO CA 93725	
33432045T						
33433053U						
33522012	MCCLURG JACKIE J		2222 E MANNING	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
33021112	ESTRADA RAUL & LUCY C		2120 E AMERICAN AVE	FRESNO CA 93725		
33021132	RODRIGUEZ GILBERTO I & EVA M		2438 E AMERICAN	FRESNO CA 93725		
33432009	SCHMALL KENNETH A & KATHY		5523 S PEACH	FRESNO CA 93725		
33432028	BANUELOS RIGOBERTO & ORTENCIA G		6412 S WALNUT	FRESNO CA 93706		
33425028	YERGAT KIRK & KATHY TRS		2121 E MORTON	FRESNO CA 93725		
33522014	YBARRA ANASTACIA & ERNESTINA		2048 E MANNING AVE	FRESNO CA 93725		
33401003U						
33019022	CUNHA LINDA S TRS		4775 S CEDAR	FRESNO CA 93725		
33433024	LAZARUS RICHARD TRUSTEE		P O BOX 2831	FRESNO CA 93745		
33433050	LUCERO GARY & TERRY A		2470 E LINCOLN	FRESNO CA 93725		
33435014	SCHWABENLAND MARIE		5216 S ORANGE	FRESNO CA 93725		
33435033	SUOS MANO & SOPHON SAR		5245 S CEDAR	FRESNO CA 93725		
33021131	RODRIGUEZ GILVERTO I & EVA MACIAS		2438 E AMERICAN	FRESNO CA 93725		
33021130	MARINO DOUGLAS & KIMBERLY A		2416 E AMERICAN	FRESNO CA 93725		
33431054U						
33811044S	HUIZAR ARTURO		2226 E FLORAL	FRESNO CA 93725		
04216004S	VASQUEZ HENRY & MARIA TRUSTEES		7671 S ORANGE	FRESNO CA 93725		
38502040T	MONROE ELEM SCH DIST					
38520006	WASSON TERRY WAYNE & CYNTHIA FAYE	WASSON TERRY WAYNE & CYNTHIA FAYE	3848 E EFIRD	SELMA CA 93662		
33806071	NGUYEN THANH B	NGUYEN TONY TRUC	2311 E DINUBA	FRESNO CA 93725		
33806069S	LUCERO KENNETH J & RACHEL R		2815 E DINUBA	FRESNO CA 93725		
33810012	COX SANDRA L		9786 S CEDAR	FRESNO CA 93725		
33810011	SPATE STEVEN R & TRACY L		11454 S PEACH	FRESNO CA 93725		
33811009	ARVIZU MARTIN		2590 E FLORAL	FRESNO CA 93725		
33811034S	POULSEN BRUCE ARTHUR	POULSEN BRUCE A ETAL	1121 E KELSO	FRESNO CA 93720		
04201006U	Burlington Northern & Santa Fe R.R.					
04225001S	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
38502056	MARTINUSEN MICHAEL JOHN		3148 E NEBRASKA	FRESNO CA 93725		
04218001	SINGH BALDEV KISHAN & PARKASH KAUR		13526 S ELM	CARUTHERS CA 93609		
04218003	PANOO MICHAEL ANTHONY TRUSTEE		2515 HILLCREST	SELMA CA 93662		
33514031	CEDAR AVENUE PROPERTIES LTD		8570 S CEDAR	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
33808024U						
33514027	MARTHEDAL JON E & SANDRA J		8180 S ORANGE	FRESNO CA 93725		
38518052S	PARAMOUNT FARMING CO INVESTMENTS II LLC		% PARAMOUNT LAND CO LP	33141 E LERDO HWY	BAKERSFIELD CA 93308	
38514024S	INGOYEN JOSEPH	INGOYEN JULIAN ETAL	38588 ROAD 8	KINGSBURG CA 93631		
38514020	JONES EDWARD CASEY & JANA LEIGH TRS		8098 E MOUNTAIN VIEW	SELMA CA 93662		
38508119	ROMERO LUPE R TRUSTEE		13242 S CHESTNUT	SELMA CA 93662		
38511080	LEON ANELI		14358 S WILLOW	SELMA CA 93662		
38514021S	NASH MILDRED TRUSTEE		4225 E CONEJO AVE	SELMA CA 93662		
38508114S	EADS EDGAR WAYNE & SHERRILL A		13279 S WILLOW	SELMA CA 93662		
04218012	TOWNSEND JOHNNY R & MAYLENE TRUSTEES		12319 S CHESTNUT	FRESNO CA 93725		
38521024	RISENHOOVER WENDELL & BARBARA		4304 W BUENA VISTA	VISALIA CA 93291		
38501002U						
05602059S	IRIGOYEN FARMS INC		14801 S CLOVIS	SELMA CA 93662		
05602063S	IRIGOYEN JOSEPH M	IRIGOYEN JOSE LUIS ETAL	14801 S CLOVIS	SELMA CA 93662		
05603011	RAVEN TIMOTHY & DEBRA	RAVEN THEODORE GEORGE & DONNA TRS ETAL	% R & R RANCHES INC	4706 E CONEJO AVE	SELMA CA 93662	
05603010S	PRG FARMS L P		12126 S HIGHLAND	SELMA CA 93662		
38505101	GARZELLI JAMES J & MICHELLE S		995 E GLEASON	FOWLER CA 93625		
38514016	SMITH GEORGIA MAE		15521 S PEACH AVE	SELMA CA 93662		
38511049	GATHRIGHT BOBBY & DORIS		14474 S WILLOW	SELMA CA 93662		
05603047S	RAVEN FAMILY LIMITED PARTNERSHIP		5700 E CLARKSON AVE	SELMA CA 93662		
33021106U						
33021113	LIU EDWARD	LIU ALINA	2323 S VALENTINE	FRESNO CA 93706		
33522031	CEDAR AVENUE PROPERTIES LTD		8570 S CEDAR	FRESNO CA 93725		
38520019	CRITCHLEY JAMES B		15462 S PEACH	SELMA CA 93662		
38508115S	HAROS RALPH & DOLORES		13335 S WILLOW	SELMA CA 93662		
05609011S	TOS FARMS INC		9240 EXCELSIOR AVE	HANFORD CA 93230		
38521019	RAMIREZ ADRIAN V	CRUZ MARBELLA	15288 S TOPEKA	SELMA CA 93662		
05603058S	CARTER H VINCENT & GAIL WEST TRUSTEES		2555 W BLUFF #106	FRESNO CA 93711		
05603055S	CARTER KRAIG VINCENT TRUSTEE	CARTER KIRK WALLACE TRUSTEE ETAL	39671 RD 28	KINGSBURG CA 93631		
05603043S	RAVEN SCOTT		5700 E CLARKSON	SELMA CA 93662		
05603044S	FRESNO FARMING LLC		% FOSTER POULTRY FARMS	ATTN TAX DEPT	P O BOX 457	LIVINGSTON CA 95334

APN	Owner Name	Owner Name 2	Mailing Address			
38508134S	NASH MILDRED TRUSTEE		4225 E CONEJO	SELMA CA 93662		
38511072	CARDEL FARMS LP		2258 E RIVERDALE	LATON CA 93242		
38517050	RAVEN FAMILY LIMITED PARTNERSHIP		5700 E CLARKSON AVE	SELMA CA 93662		
38518022	ADAMS DONALD J & MANYA P		5433 E CLARKSON AVE	SELMA CA 93662		
38508140	ARVIZU LORENZO OROZCO & CARMEN H	ARVIZU LORENZO H	1506 FLORAL	SELMA CA 93662		
33021109	KIRKORIAN ZACK		4690 S CEDAR	FRESNO CA 93725		
04217008	HAYES BOBBY DEAN & ELSIE IONE		2690 E NEBRASKA AVE	FRESNO CA 93725		
04201005S	VIE DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
33522030	ELSTER WILLIAM O & LINDA A		8863 N 5TH ST	FRESNO CA 93720		
33433054	RIVAS SANTOS & SOFIA		5511 S MAPLE	FRESNO CA 93725		
48001028U						
33801002U						
05603041S	GREWAL PARMJIT S & GURINDER K TRS		16576 S FOWLER	SELMA CA 93662		
33811010	ARVIZU MARTIN		2590 E FLORAL	FRESNO CA 93725		
04216003	EMERZIAN JERRY A & ROSALYN S TRUSTEES		1055 N VAN NESS #C-2	FRESNO CA 93728		
33021134	RACO FRED A & BARBARA JOAN		2093 E MALAGA	FRESNO CA 93725		
04218005	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
33021122	SINGH GURMEET & SARBJIT KAUR		P O BOX 398	FOWLER CA 93626		
38518036S	GOMEZ RODNEY & VANIECA LYNN		5306 E ELKHORN	SELMA CA 93662		
05603040S	SIHOTA FAMILY PARTNERS LP		12174 S TEMPERANCE AVE	SELMA CA 93662		
04216024S	ROSS LOELLA COLLEEN LIFE ESTATE		% NEIL DONOVAN	1354 E SAINT JAMES	FRESNO CA 93720	
04216025S	DONOVAN NEIL ALAN & ASHLEY LYNN		1354 E ST JAMES CIR	FRESNO CA 93720		
33425029	NAPOLI ROSARIA TRUSTEE		6261 S MAPLE	FRESNO CA 93725		
33425023	MC CANN MURRAY C	DUCKWORTH SHARON	2189 E MORTON	FRESNO CA 93725		
33517026	MARTIN FRANK JR & TEDRA G TRUSTEES		P O BOX 732	FOWLER CA 93625		
33511040	SPARKS DORIS L TRUSTEE		7647 S MAPLE	FRESNO CA 93725		
33407007	YOSHIOKA KATSUMI & SHIZUKO TRUSTEES		6201 S CEDAR AVE	FRESNO CA 93725		
04219011S	VIE-DEL COMPANY		P O BOX 2908	FRESNO CA 93745		
48001002U	Union Pacific Railroad Co					
46702030U						
46702032U						
33002110	CAGLIA FRANK S FAMILY LTD PARTNERSHIP		P O BOX 446	FRESNO CA 93709		

APN	Owner Name	Owner Name 2	Mailing Address			
48001003U	Union Pacific Railroad Co					
33001009U						
48705074	HOW HARRY N II & ROSELINE C TRS		650 LIGHTHOUSE AVE #200	PACIFIC GROVE CA 93950		
47903075	FLORES FRANK TRUSTEE	HUGHES WILLIAM S TRUSTEE	5410 E HOME	FRESNO CA 93727		
48710032S	SHUBIN WILLIAM M & MARTHA TRUSTEES		7033 W RIALTO	FRESNO CA 93722		
48015109	VILLARREAL PROPERTIES		P O BOX 12102	FRESNO CA 93776		
48001010U	Union Pacific Railroad Co					
33003176	OLD DOMINION FREIGHT LINE INC		500 OLD DOMINION WAY	THOMASVILLE NC 27360		
47829017	SAKKIS CONSTANTINE & CAROL ANN TRS		967 SAN SIMEON DR	CONCORD CA 94518		
33002110	CAGLIA FRANK S FAMILY LTD PARTNERSHIP		P O BOX 446	FRESNO CA 93709		
47829020	LUST KENNETH & HELEN C TRUSTEES		3175 W MADISON	FRESNO CA 93706		
46702018	FRESNO RESCUE MISSION		P O BOX 1422	FRESNO CA 93716		
48710036	COSSETTE INVESTMENT COMPANY INC		P O BOX 9354	FRESNO CA 93791		
33003169	CHAPA VICTOR & MARIA A	CHAPA VICTOR SR & MARIA A TRUSTEES	4038 S CEDAR	FRESNO CA 93725		
47829022	DEBRATA LLC		P O BOX 12224	FRESNO CA 93777		
48001016U						
48714034	SELSOR ROGER L		4492 W VANDGRIFT	FRESNO CA 93722		
48718006	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
48714022U						
48710018	D & P ENTERPRISES LLC	D & P ENTERPRISES LLC	2660 S RAILROAD	FRESNO CA 93725		
48718004	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
48714049	C&S LOGISTICS OF FRESNO LLC		7 CORPORATE DR	KEENE NH 03431		
48714051	BARLEY EQUITIES II LLC		11150 SANTA MONICA BLVD	#1425	LOS ANGELES CA CA 90025	
47816303	DILLDINE WAYMON W & BARBARA K TRUSTEES		6762 E BELMONT	FRESNO CA 93727		
47810204	MANOOGIAN HARRY H		1939 S COUNTRY CLUB LN	FRESNO CA 93727		
48714048	C&S LOGISTICS OF FRESNO LLC		7 CORPORATE DR	KEENE NH 03431		
48714053T						
48710006U						
48718005	THOMASON COLBURN R & VALDENE		7090 N MARKS #102	FRESNO CA 93711		
33003170S	CALAVERAS MATERIALS INC		% RYAN INC	ATTN K WEAVER	13155 NOEL RD #100	DALLAS TX 75240
33003147	SFPP L P		% TAX DEPARTMENT #729A	1100 TOWN & COUNTRY RD	ORANGE CA 92862	

APN	Owner Name	Owner Name 2	Mailing Address			
33006046S	CROWN ENTERPRISES INC		% REAL ESTATE DEPT	P O BOX 869	WARREN MI 48090	
47810210	VEGA MICHAEL A	VEGA FRANCISCO J II ETAL	2276 BROWNING	CLOVIS CA 93611		
48013105	GERHARDT FREDRICK & LYNN M		29510 AVENUE 5 1/2	MADERA CA 93637		
48018208	CHAVEZ REGINO & GUILLERMINA	ALVAREZ JOSE	1630 E FLORADORA	FRESNO CA 93728		
48714046	VALOV JOHN F TRUSTEE		18275 RD 28	TULARE CA 93274		
33002120ST						
48036019S	MASTEN JOHN W TRUSTEE		P O BOX 2697	FRESNO CA 93745		
48036001U						
48705072	CENTRAL VALLEY TRAILER	RENTAL & LEASING INC	2626 S RAILROAD	FRESNO CA 93725		
48002077	MEYER DORSEY R	MEYER DORSEY R	P O BOX 2247	JONESBORO AR 72402		
48001012U						
48705073	SILVA FRANCIS E		% V SILVA	244 N BUSH	FRESNO CA 93727	
33002119S	FRESHKO ESTATES I LLC		P O BOX 21008	LOS ANGELES CA 90021		
33002121S	FRESHKO ESTATES I LLC		P O BOX 21008	LOS ANGELES CA 90021		
48015412	GAONA AUGUSTINE & BERTHA L		4758 N ARROW RIDGE WAY	CLOVIS CA 93619		
47911025	THERMO KING FRESNO INC		P O BOX 2367	FRESNO CA 93745		
48036028S	FMC CORPORATION		% J HARLEY	1735 MARKET ST	PHILADELPHIA PA PA 19103	
48710036	COSSETTE INVESTMENT COMPANY INC		P O BOX 9354	FRESNO CA 93791		
33003103	S & F INVESTMENTS LLC		5560 N PARRISH WAY	FRESNO CA 93711		
487010589	LULE J ANTONIO ROSAS		1333 SYCAMORE DR	WASCO CA 93280		
487010597	WASCO CITY OF		P O BOX 190	WASCO CA 93280		
487020158	A T & SF RR					
489041012	CITY OF WASCO		UNKNOWN	CA		
200240001	MINA ORCHARD LLC		C/O KINZEL & CO	195 FAIRFIELD AVE #10	WEST CALDWELL NJ 07006	
293200008	SCHAKEL FAMILY PTNRS L P		P O BOX 1017	TIPTON CA 93272		
291020028	BNSF RAILWAY CO		2650 LOU MENK DR 2ND FLR	PO BOX 961057	FORT WORTH TX 76161-0057	
291030036	MORRIS PROCTOR INC		P O BOX 623	CORCORAN CA 93212		
311040022	SCHAKEL FAMILY PARTNERSHIP LP		PO BOX 1017	TIPTON CA 93272		
311080002	WHITE RANCH LAND COMPANY LLC		2809 UNICORN RD STE 107	BAKERSFIELD CA 93308		
311080004	FRAZEE ELEANOR E (EST OF)		C/O BERNICE R SNYDER	721 ODEN ST	CONFLUENCE PA 15424-1035	
311080005	SHEELY SHIRLEY		543 EAGLE NEST ST NW	SALEM OR 97304		
311090008	GUTIERREZ JAIME B		679 ROAD 152	DELANO CA 93215		

APN	Owner Name	Owner Name 2	Mailing Address			
311090012	LOVEALL RONALD T		P O BOX 164	ALPAUGH CA 93201		
311090013	LANTING GEORGE & MARILYN (CO-TRS)(R		4738 AVE 120	CORCORAN CA 93212		
311090032	SPS ALPAUGH 50 LLC (LSE)		C/O GCL SOLAR ENERGY INC	ONE MRKT PLAZA STEUART TWR1800	SAN FRANCISCO CA 94105	
313040005	CALIF STATE OF DP&R		P O BOX 942896	SACRAMENTO CA 94296-0001		
313070001	ALPAUGH IRRIGATION DISTRICT		PO BOX 129	ALPAUGH CA 93201-0129		
333062001	JOHN HANCOCK LIFE INSURANCE COMPANY		301 E MAIN STREET	TURLOCK CA 95380		
333072001	JOHN HANCOCK LIFE INSURANCE COMPANY		301 E MAIN STREET	TURLOCK CA 95380		
333102004	WARD JAMES LARRY		5433 W JUDY LN	VISALIA CA 93277		
333102005	JOHNSTON DAVID R		492 NO ALTA AVE	DINUBA CA 93618		
333102006	THOMPSON GRACE L (EST OF)		C/O JAMES BISBEE	14014 E CARNELL ST	WHITTIER CA 90605	
333102051	MC CALLUM RETA E		220 N OLIVE AVE APT A	ALHAMBRA CA 91801		
333102052	LOVELL LILLIAN J & HOWARD A		1012 E FIRST ST	NATIONAL CITY CA 92050		
333104004	JOHN HANCOCK LIFE INSURANCE COMPANY		301 E MAIN STREET	TURLOCK CA 95380		
333340079	NUNO SAMUEL V & BLANDINA M		1481 ROAD 80	EARLIMART CA 93219		
333370004	JCP RANCH PROPERTIES INC		P O BOX 548	DELANO CA 93216		
333390002	ALFARO MARTIN A & MARIA R		P O BOX 11371	EARLIMART CA 93219		
333390003	KEIKIKANE LILLIAN		867 PALOMA AVE	OAKLAND CA 94610		
026020032	WILSON STANLEY & NANCY REV TR		PO BOX 817	SHAFTER CA 93263		
027370063	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028180222	CITY OF SHAFTER		320 JAMES ST.	SHAFTER CA 932632033		
028180230	MURPHY PRODUCTS CO					
028190031	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028190049	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030092027	F & R AUTO REPAIR		1233 G ST	WASCO CA 93280		
030210017	VALENZUELA (DE LA TORRE) JUAN A & LORENA		850 POSO DR	WASCO CA 93280		
047130125	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130133	TE VELDE DAVID & ALICE REV TR	TE VELDE DAVID & ALICE TRS	5984 4TH AV	HANFORD CA 93230		
047130141	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047130158	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110069	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120118	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		

APN	Owner Name	Owner Name 2	Mailing Address			
047120126	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120142	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047220082	SEMITROPIC IMPROVEMENT DISTRICT		1101 CENTRAL AV	WASCO CA 93280		
047220108	JIMENEZ SERGIO		26311 MERCED AV	WASCO CA 932809613		
047350020	NESHEIWAT EDWARD JOB		28589 POND RD	WASCO CA 93280		
047350038	NESHEIWAT BASHAR YACOUB		28593 POND RD	WASCO CA 932809789		
047350046	NESHEIWAT BASHAR YACOUB		28593 POND RD	WASCO CA 932809789		
047350053	LUDY DORIS M TEST TR		2304 W THOMASON PL	FRESNO CA 937117173		
059280149	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
059210039	PREMIERE AGRICULTURAL PROP LLC		2004 FOX DR	CHAMPAIGN IL 61820	STE L	
059210369	PREMIERE AGRICULTURAL PROP LLC		2004 FOX DR	CHAMPAIGN IL 61820	STE L	
059280560	DEMLER MARY K		P O BOX 207	WASCO CA 932800207		
059280578	NEUFELD ROBERT D		29136 MCCOMBS RD	WASCO CA 932809678		
071050272	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
072110034	MC CONNELL MELVIN M FARMS		P O BOX M	WASCO CA 93280		
072110059	BLOEM MAS FARMS		920 TORNELL DR	RIPON CA 95366		
072180037	SUN WORLD INTERNATIONAL LLC		16350 DRIVER RD	BAKERSFIELD CA 93308		
072180052	FAMILY TREE FARMS LLC		11721 STINE RD	BAKERSFIELD CA 93313		
072180078	NIKKEL FAMILY TR	NIKKEL JACK H & JUNE ANN TRS	P O BOX 593	LOS OLIVOS CA 93441		
072190119	WAGNER LOIS M TR		6901 COURTSIDE CI	BAKERSFIELD CA 93309	# 14	
072240062	PIONEER FARM EQUIPMENT CO		P O BOX 12406	FRESNO CA 93777		
072240070	PIONEER FARM EQUIPMENT CO		P O BOX 12406	FRESNO CA 93777		
089020150	WILSON G&P TRUST	WILSON GARY B & PATRICIA P TRS	P O BOX 1300	SHAFTER CA 93263		
089020457	WALLACE FMLY TR	WALLACE JOHN L & CINDY L TRS	1860 OCONNOR WY	SAN LUIS OBISPO CA 93405		
089020465	HANDEL DENNIS & JANICE FMLY TR		413 CENTRAL AV	SHAFTER CA 932632155		
089030027	TWINKLE TRUST	STARRH FRED L JR TRS	1280 N POPLAR AV	SHAFTER CA 93263		
089070437	SHAFTER WASCO GINNING CO		P O BOX 1567	SHAFTER CA 93263		
089070445	SHAFTER WASCO GINNING CO		P O BOX 1567	SHAFTER CA 93263		
089150080	LELAND & SHIRLEY BELL FAMILY LLC		1499 E LOS ANGELES AV	SHAFTER CA 93263		
090010034	GROSS ALICE PAINTER		1005 PARADISE WY	PALO ALTO CA 94306		

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APN	Owner Name	Owner Name 2	Mailing Address			
090010059	FURROW FARMS		P O BOX 849	SHAFTER CA 93263		
090010018	PREMIERE FARMLAND PARTNERS IV L P	WESTCHESTER GROUP INC	PO BOX 3009	CHAMPAIGN IL 618263009		
090010174	LUM CHARLES		2109 GLENDON CT	BAKERSFIELD CA 933093631		
090180241	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091270231	MILLIEN DWAYNE A & CARRIE M		32163 LORAINE ST	SHAFTER CA 93263		
091270249	LEE GREG S		32166 7TH STANDARD RD	SHAFTER CA 932639772		
091270256	PRECIADO RAMON & MARIA A		189 E LERDO HW	SHAFTER CA 93263		
091270454	QUEZADA JAIME R		226 PINE CT	TEHACHAPI CA 93561		
091280016	DUKE JOY		19401 SANTA FE WY	SHAFTER CA 93263		
091280032	BARTLETT LARRY E & CONNIE		34357 MERCED AV	BAKERSFIELD CA 933089523		
091172015	FARMLAND RESERVE INC	TAX ADM DIV 536-6224	PO BOX 511196	SALT LAKE CITY UT 841511196		
091251512	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091252031	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091270041	MILLIEN DWAYNE ALAN & CARRIE MICHELLE		32163 LORAINE LN	SHAFTER CA 93263		
091270058	EVERS JIM		11410 TALLADEGA CT	BAKERSFIELD CA 93312		
091270066	DALBY MERCY		32157 LORAINE DR	SHAFTER CA 93263		
002120048000	GARCIA, GUS & SANDRA H/W		2251 9TH AVE	LATON CA 93242		
002120068000	STOUT, RONALD & PAMELA TRUST 50%		2004 9TH AVE	LATON CA 93242		
014251015000	REYNOSO, LORENZO G & BERTHA A H/W		8478 LACEY BLVD	HANFORD CA 93230		
014251026000	REYNOSO, LORENZO G & BERTHA A H/W		8448 LACEY BLVD	HANFORD CA 93230		
014251008000	ARCHER, ROBERT C & MARY E H/W		8408 E LACEY BLVD	HANFORD CA 93230		
014242026000	RAMIREZ, CLAUDIA		332 LIME ST APT #1	INGLEWOOD CA 90301		
014060038000	M C LAND COMPANY		7297 ELDER AVE	HANFORD CA 93230		
014060059000	M C LAND COMPANY		7297 ELDER AVE	HANFORD CA 93230		
016260026000	BRAZIL, TONY J & VIRGINIA L REV LV TR		13419 7TH AVE	HANFORD CA 93230		
016130047000	WARMERDAM DAIRY A PTP		464 E FARGO AVE	HANFORD CA 93230		
016130059000	LEAL, DANIEL & BELLE LIVING TRUST		6236 HANFORD-ARMONA RD	HANFORD CA 93230		
028080003000	BRAZIL, TONY J & VIRGINIA L REV LVG TRUST		13419 7TH AVE	HANFORD CA 93230		
034040009000	COLLI, ALISA M SEP PRO TRUST		24317 5 1/2 AVE	CORCORAN CA 93212		
034040004000	COLLI, ALISA M SEP PROP TRUST		C/O ALISA M GOMEZ TRUSTEE	24317 5 1/2 AVE	CORCORAN CA 93212	
33407039	JOHNSTON FLORENCE L TRUSTEE	MUSSON EVERETT W JR TRUSTEE	1747 E LINCOLN	FRESNO CA 93725		

APN	Owner Name	Owner Name 2	Mailing Address			
48009011	SOEX WEST REAL ESTATE LLC		3294 E 26TH ST	LOS ANGELES CA 90023		
33808015	FOWLER PACKING COMPANY INC		8570 S CEDAR	FRESNO CA 93725		
38520011	MULLIGAN J G		228 JUSTIN CT	SHAFTER CA 93263		
33010007T	MALAGA CO WATER DIST					
48714025U						
46702041S	LORENZO JOSE M & ESMERALDA		1433 W SIERRA	FRESNO CA 93711		
47810220T						
33006017ST	ST OF CA					
200210007	LOWER TULE RIVER IRRIGATION DISTRIC		ATTN DANIEL G VINK	357 E OLIVE AVE	TIPTON CA 93272	
291030043	TE VELDE GREGORY J		5850 AVENUE 160	TIPTON CA 93272		
311080012	WHITE RANCH LAND CO LLC		2809 UNICORN RD STE 107	BAKERSFIELD CA 93308		
313040010	POPINJAY CORP N V		C/O UTE KAMPMANN	WEINBERGSTR 7A	CH 6300 ZUG SUISSE SWITZERLAND	
313040012	ANGIOLA WATER DISTRICT		P O BOX 3288	CLOVIS CA 93613		
313050013	ALPAUGH IRRIGATION DISTRICT		ATTN: LAVON PENROD, MANAGER	P O BOX 129	ALPAUGH CA 93201-0129	
313050014	ALPAUGH IRRIGATION DISTRICT		PO BOX 129	ALPAUGH CA 93201-0129		
313060005	ATWELL ISLAND WATER DISTRICT		P O BOX 220	ALPAUGH CA 93201		
014230062000	SOUTHERN PACIFIC TRANSPORTATION CO		PROPERTY TAX DEPT	UNION PACIFIC RAILROAD CO	1700 FARNAM ST 10TH FLOOR S	OMAHA NE 68102-2010
016200026000	DIAS, JOE & ANGELINA LIVING TRUST		11951 7TH AVE	HANFORD CA 93230		
016200019000	MARTELLA, ROBIN W REVOCABLE TRUST		P O BOX 7687	VISALIA CA 93290		
016070036000	COELHO, GLORIA J LIVING TRUST		8881 HOUSTON AVE	HANFORD CA 93230		
026040287	WILSON STANLEY & NANCY REV TR		PO BOX 817	SHAFTER CA 93263		
027070317	JMMKM INVS INC		737 MANNEL AV	SHAFTER CA 93263		
030422026	RAMIREZ ISRAEL V & GRACIELA		9744 RAMOS AV	BAKERSFIELD CA 93307		
030422059	RAMIREZ ISRAEL V & GRACIELA		9744 RAMOS AV	BAKERSFIELD CA 93307		
047110010	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110028	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047110143	TE VELDE DAVID & ALICE REV TR		5985 4TH AV	HANFORD CA 93230		
047120043	TE VELDE DAVID & ALICE REV TRUSTR	TE VELDE DAVID & ALICE TRS	5985 4TH AV	HANFORD CA 93230		
047120050	VALLADARES RAMONA C		615 S LEXINGTON ST	DELANO CA 93215	SP 50	
047120068	PEREZ ELENA		345 CARMEL DR	DELANO CA 93215		
059280305	IAFRATI ANTHONY LIV TRUST		P O BOX 1212	DELANO CA 932161212		

APN	Owner Name	Owner Name 2	Mailing Address			
059210211	POND RANCH LLC		7616 N MONTE AV	FRESNO CA 93711		
059280727	CARDAMONE JOSEPH & WENDY A		28988 MC COMBS AV	WASCO CA 93280		
072170038	WASCO REAL PROPERTIES I LLC		P O BOX 1200	WASCO CA 93280		
072170095	A T & S F R R		5200 E SHIELA ST	LOS ANGELES CA 90040		
071060040	STERLING GRANT LP		2235 HIGHWAY 46	WASCO CA 93280	STE 101	
072170251	LEWIS-NUNEZ-VELASQUEZ TR		P O BOX 609	SHAFTER CA 932630609		
072170301	DANIEL CARL R & PATRICIA A FMLY TR		16201 JOHNSON RD	BAKERSFIELD CA 93314		
072170343	TREEHOUSE CAL ALMONDS LLC		PO BOX 64489	LOS ANGELES CA 900640489		
072170350	WASCO REAL PROP II LLC		PO BOX 1200	WASCO CA 932808100		
072180219	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
089020572	JEFFRIES RYAN & BUNNY		1145 FAIRWAY DR	BAKERSFIELD CA 933092460		
089020663	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
090020066	RILLIAMS THOMAS JAMES		31396 BURBANK AV	SHAFTER CA 93263		
090180092	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091270330	DALBY MERCY		32157 LORAINE DR	SHAFTER CA 93263		
091252262	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091252346	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
487020075	SAN JOAQUIN TRACTOR CO INC		P O BOX 70067	BAKERSFIELD CA 93387		
489041061	ORTIZ JOHN M		29398 BLANKENSHIP AV	WASCO CA 93280		
489041079	WINKLE CYNTHIA L		1000 MT VERNON AV	BAKERSFIELD CA 93307		
489041095	REYNA CARLOS G		2409 FLOWER ST	WASCO CA 93280		
489041103	REYNA CARLOS G		2409 FLOWER ST	WASCO CA 93280		
489041111	REYNA CARLOS G		2409 FLOWER ST	WASCO CA 93280		
33806068U						
48714039S	C&S LOGISTICS OF FRESNO LLC		7 CORPORATE DR	KEENE NH 03431		
47810203	MANOOGIAN HARRY H		1939 S COUNTRY CLUB LN	FRESNO CA 93727		
200220015	COOPER TIMOTHY J & BARBARA C (TRS)		P O BOX 25	CORCORAN CA 93212		
200220016	COOPER TWILA JEWEL (TR DISCLAIMER T		3741 W ORCHARD CT	VISALIA CA 93277		
291080011	SANDRIDGE PARTNERS LP		920 W FREMONT AVE	SUNNYVALE CA 94087		
291020023	HANSEN PHILLIP W(TR)(SEP PROP TR)		C/I HANSEN RANCHES	P O BOX 398	CORCORAN CA 93212	
291020024	HANSEN PHILLIP W(TR)(SEP PROP TR)		C/O HANSEN RANCHES	P O BOX 398	CORCORAN CA 93212	
291030030	MORRIS PROCTOR INC		P O BOX 623	CORCORAN CA 93212		

APN	Owner Name	Owner Name 2	Mailing Address			
888888888						
888888888						
028290038000	CORCORAN IRRIGATION DISTRICT		P O BOX 566	CORCORAN CA 93212		
034070001000	JONES, MARILYN D LIVING TRUST 50%		5749 NEWARK AVE	CORCORAN CA 93212		
47810211	VEGA MICHAEL A	VEGA FRANCISCO JII ETAL	2276 BROWNING	CLOVIS CA 93611		
47810202	FRANKIAN JOHN & MARSHA M TRUSTEES	FRANKIAN JOHN R & MARSHA A	% FRANKIAN CONSTRUCTION	2140 S RAILROAD	FRESNO CA 93721	
48015309	GARCIA BALDOMERO		7402 W BELMONT	FRESNO CA 93723		
48018202	MYTYCH DIANE MADGE FISHER	MAGGY BRADLEY A	41150 DAWN	MADERA CA 93638		
47822212	HUDSON GILDA A TRUSTEE		% K HUDSON	PO BOX 17130	FRESNO CA 93744	
47829018	DEBRATA LLC		P O BOX 12224	FRESNO CA 93777		
47829023	LAY KIM VINH & FEN XIEU HENG		2395 SOUTH G	FRESNO CA 93721		
48015410	MADRIGAL S TRUCKING	BECKER BILLIE TRUSTEE	P O BOX 2861	FRESNO CA 93745		
47822108	SARAH 2306 TRUST DTD 4-28-11		12656 DARYL AVE	GRANADA HILLS CA 91344		
47810214	MARMOLEJO LARRY S		3827 E LIBERTY	FRESNO CA 93702		
48015408	PEREZ SUZANNA E TRUSTEE		5534 E KINGS CANYON #B	FRESNO CA 93727		
47829002	CAMPOS VICTOR & CANDELARIA GODINEZ		3135 FINE	CLOVIS CA 93612		
38517052	SILVEIRA OLIVIA I TRUSTEE		12806 S FOWLER	SELMA CA 93662		
33021125T						
38517011	MARQUEZ CRUZ P & VERONICA		4630 E ELKHORN	SELMA CA 93662		
47911024	THERMO KING FRESNO INC		2410 S RAILROAD	FRESNO CA 93706		
48018214	CHAVEZ REGINO & GUILLERMINA	ALVAREZ JOSE	1630 E FLORADORA	FRESNO CA 93728		
47829027	WIERMAN PAULETTE C		4886 N ARTHUR	FRESNO CA 93705		
48013220	LAKIN DALE B TRUSTEE		1176 W SAN BRUNO	FRESNO CA 93711		
48018213	BETTENCOURT JOHN D & DEBBY J		P O BOX 243	CLOVIS CA 93613		
47816309	DILLDINE WAYMON W & BARBARA K TRS		6762 E BELMONT AVE	FRESNO CA 93727		
33811045S	ESQUIVEL SANTOS CORVERA & CHRISTINA G		2266 E FLORAL	FRESNO CA 93725		
33811043S	HUDSON HAROLD L TRUSTEE		2310 E FLORAL	FRESNO CA 93725		
38508126	VELASCO OSCAR		4231 5TH AVE NW	SEATTLE WA 98107		
38517038S	BLOM GEORGE R TRUSTEE		1720 PEARL ST	ALAMEDA CA 94501		
38517033	BLOM GEORGE RAYMOND TRUSTEE		1720 PEARL ST	ALAMEDA CA 94501		
38517040S	MENEZES ALICE TRUSTEE		4409 E CLARKSON	SELMA CA 93662		
38517041S	DIAZ NORBERTO M & YESENIA ORTIZ DE		16839 S CLOVIS	SELMA CA 93662		

RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

APN	Owner Name	Owner Name 2	Mailing Address			
026010041	JEFFRIES FAMILY L P		P O BOX 1570	SHAFTER CA 93263		
026010058	JEFFRIES BRYAN WILLIAM		P O BOX 1570	SHAFTER CA 93263		
026010132	GARGAN J&K FAMILY TRUST	GARGAN JOHN M & KATHY A TRS	18251 JOHNSON RD	BAKERSFIELD CA 93314		
026010272	WILSON STANLEY & NANCY REV TR		PO BOX 817	SHAFTER CA 93263		
027070135	CAVALIER MILLS INC		23890 COPPER HILL DR	VALENCIA CA 91354	#280	
027360098	FLOYDS STORES INC		P O BOX 2940	BAKERSFIELD CA 93303		
027360122	STRONG CAPITAL V LP		5910 N CENTRAL EXPRESSWAY	DALLAS TX 75206	STE 1580	
028010098	CITY OF SHAFTER		UNKNOWN	CA		
028180123	W C HANDEL & SONS INC		P O BOX 609	SHAFTER CA 93263		
028180131	MMC INVS LLC		5010 YOUNG ST	BAKERSFIELD CA 93311		
028180255	BROWN & BRYANT INC		P O BIN T	SHAFTER CA 93263		
028180263	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028180388	SHAFTER CITY OF		336 PACIFIC AV	SHAFTER CA 932632215		
028180602	WEAVER FAMILY LP		15511 JOHNSON RD	BAKERSFIELD CA 93314		
028180610	WEAVER FAMILY LP		15511 JOHNSON RD	BAKERSFIELD CA 93314		
028190056	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
028290088	FRESHMAN S & A TRUST		6151 CENTURY BL	LOS ANGELES CA 90045	# 300	
089150122	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
089150130	VIGNOLO JANE K	VIGNOLO ROBERT J	P O B0X 1270	SHAFTER CA 932631270		
089150254	LELAND & SHIRLEY BELL FAMILY LLC		1499 E LOS ANGELES AV	SHAFTER CA 93263		
089230189	CITY OF SHAFTER		320 JAMES ST	SHAFTER CA 932632033		
091270199	REED LLOYD & CHERYL		32176 7TH STANDARD RD	SHAFTER CA 932639772		
091251371	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
091251470	PARAMOUNT LAND COMPANY LLC		33141 LERDO HW	BAKERSFIELD CA 933089767		
030020317	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030030100	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030042022	CERTIS U S A LLC		9145 GUILFORD RD	COLUMBIA MD 21046	STE 175	
030082028	WASCO CITY OF		764 E ST	WASCO CA 93280		
030082036	BNSF RAILWAY CO		PO BOX 961039	FORT WORTH TX 76161		
030436018	WESTERN AG INV INC		116 ANNIN	WASCO CA 93280		
030436026	WESTERN AG INV INC		116 ANNIN	WASCO CA 93280		

APN	Owner Name	Owner Name 2	Mailing Address			
030441042	CAMPOS GUILLERMO & MARIA E		17893 LEONARD AV	SHAFTER CA 93263		
030441059	CAMPOS GUILLERMO & MARIA E		17893 LEONARD AV	SHAFTER CA 93263		
030441083	LOWE BROS HAY SERVICE INC		P O BOX P	WASCO CA 93280		
030441091	CAMPOS GUILLERMO & MARIA E		17893 LEONARD AV	SHAFTER CA 93263		
072110208	MELVIN M MC CONNELL FARMS		P O BOX M	WASCO CA 93280		
487020224	HOWARD HAY CO INC		PO BOX 370	GLENNVILLE CA 93226		
487250011	WASCO CITY OF		PO BOX 728	WASCO CA 93280		
034230049000	PREMIERE FARMLAND PARTNERS IV LP		C/O WESTCHESTER GROUP	2004 FOX DR STE L	CHAMPAIGN IL 61820	
034230038000	BOYETT FARMS		P O BOX 386	CORCORAN CA 93212		
034230026000	SALYER, FRED REVOCABLE TRUST		P O BOX 488	CORCORAN CA 93212		
034230003000	BOYETT FARMS		P O BOX 386	CORCORAN CA 93212		
034160003000	MORA, ANGEL & CIRILA H/W		19762 ROAD 30	TULARE CA 93274		
034160001000	GOMEZ, LENOR J		557 ORANGE AVE	CORCORAN CA 93212		
034070020000	WHITLATCH, MICHAEL F & BARBARA L H/W		703 BAINUM AVE	CORCORAN CA 93212		
034070005000	ALLRED LIVING TRUST 50%		413 N FRANCIS AVE	EXETER CA 93221		
034070006000	KEENEY, JOYCE		5591 NEWARK AVE	CORCORAN CA 93212		
034030008000	ROBY, GARY C		P O BOX 535	CORCORAN CA 93212		
034030013000	SOLIZ, GARY M & MICHELLE D H/W		239 5TH AVE	CORCORAN CA 93212		
034015013000	HILL, LARRY & LINDA H/W JT		208 5TH AVE	CORCORAN CA 93212		
034015011000	VALOV, JIMI J FAMILY TRUST 50%		18854 RD 24	TULARE CA 93274		
034015004000	BOYETT FARMS		P O BOX 386	CORCORAN CA 93212		
034011002000	CHEVRON CORPORATION		P O BOX 1392	BAKERSFIELD CA 93302		
034011012000	KINGS COUNTY WASTE MANAGEMENT AUTHORITY		C/O CLERK OF THE BOARD	1400 W LACEY BLVD	HANFORD CA 93230	
034080019000	HERNANDEZ, RANDY J & REGINA F H/W		5668 NEWARK AVE	CORCORAN CA 93212		
200270001	MINA ORCHARD LLC		C/O KINZEL & CO	195 FAIRFIELD AVE #10	WEST CALDWELL NJ 07006	
028290017000	SOUZA, TIMOTHY M & DEENE FAMILY TRUST		1830 W MANOR AVE	VISALIA CA 93291		
028280023000	CORCORAN IRRIGATION DISTRICT		1150 6 1/2 AVE	CORCORAN CA 93212		
030270002000	REYNOSO, FELIPE D J		P O BOX 1050	CORCORAN CA 93212		
030270008000	CAMFIL FARR INC		500 INDUSTRIAL WAY	CORCORAN CA 93212		

Appendix 2:
Project Description

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Tables

Figures

This section includes information about the engineering and design of PP1. The Project Description that follows was excerpted and condensed from the Final Environmental Impact Report/ Final Environmental Impact Statement (FEIR/FEIS); and includes those aspects of PP1 that are most relevant to the USACE in general, and to jurisdictional wetlands and other waters of the United States and the Section 404 permit in particular. Unless otherwise noted, the original source of information presented for Block 18 is Chapter 2 of the FEIR/FEIS (Authority and FRA 2014).

1.0 Overview

The California HST System is a rail line proposed by the State of California to connect the major metropolitan regions of Northern California to those in Southern California. The planning, design, construction, and operation of the HST are the responsibility of the California High-Speed Rail Authority (Authority), a state governing board formed in 1996. The Authority's statutory mandate is to develop a high-speed rail system that is coordinated with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The Authority's plans call for high-speed intercity train service on more than 800 miles of tracks throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Fresno to Bakersfield Section is located in the San Joaquin Valley and is one of 10 sections identified in the Statewide Programmatic EIR/EIS (Authority and Federal Railroad Administration (FRA) 2005).

The HST System includes the HST tracks, structures, stations, traction power substations, and maintenance facilities and train vehicles. The HST System is envisioned as a state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, which would include the latest technology, safety, signaling, and automated train-control systems. The fully grade-separated, dedicated track alignment would allow operating speeds of up to 220 miles per hour (mph), and make a trip from Los Angeles to San Francisco in approximately 2 hours and 40 minutes.

2.0 System Design

The proposed California HST System has been designed for optimal performance and to conform to industry standards and federal and state safety regulations (Table 2-2). The HST System would be a fully grade-separated and access-controlled guideway with intrusion detection and monitoring systems where required. This means that the HST infrastructure (e.g., mainline tracks and maintenance and storage facilities) would be designed to prevent access by unauthorized vehicles, persons, animals, and objects.

Table 2-2
HST Performance Criteria

Category	Criteria
System Design Criteria	Electric propulsion system Fully grade-separated guideway Fully access-controlled guideway with intrusion monitoring systems where required Track geometry to maintain passenger comfort criteria (smoothness of ride, lateral acceleration less than 0.1 g [i.e., acceleration due to gravity])
System Capabilities	Capable of traveling from San Francisco to Los Angeles in approximately 2 hours and 40 minutes All-weather/all-season operation Capable of sustained vertical gradient of 2.5% without considerable degradation in performance Capable of operating parcel and special freight service as a secondary use Capable of safe, comfortable, and efficient operation at speeds over 200 mph Capable of maintaining operations at 3-minute headways Equipped with high-capacity and redundant communications systems capable of supporting fully automatic train control
System Capacity	Fully dual track mainline with off-line station stopping tracks Capable of accommodating a wide range of passenger demand (up to 20,000 passengers per hour per direction) Capable of accommodating normal maintenance activities without disruption to daily operations
Level of Service	Capable of accommodating a wide range of service types (express, semi-express/limited stop, and local)

2.1 Infrastructure Components

The dedicated, fully grade-separated right-of-way needed to operate high-speed trains has more stringent alignment requirements than those needed for lower-speed trains. In the Fresno to Bakersfield Section, the HST alternatives would use four different track types. These track types have varying profiles: low, near-the-ground tracks are at grade, higher tracks can be elevated by either a structure or on a retained fill platform, and below-grade tracks are in a retained cut. Types of bridges that might be built include full channel spans, large box culverts, or, for some larger river crossings, piers within the ordinary high-water channel. The various track profiles are described in the following subsections.

2.1.1 At-Grade Profile

At-grade track profiles (Figure 2-2) are best suited for areas where the ground is relatively flat, as in the Central Valley, and in rural areas where interference with local roadways is less. The at-grade track would be built on compacted soil and ballast material (a thick bed of angular rock) to prevent subsidence or changes in the track surface from soil movement. To avoid potential disruption of service from floodwater, the top of the rail would be constructed above the 100-year floodplain. The height of the at-grade profile may vary to accommodate slight changes in

topography, and provide clearance for storm water culverts and structures in order to allow water flow, and, in select areas, for wildlife movement.

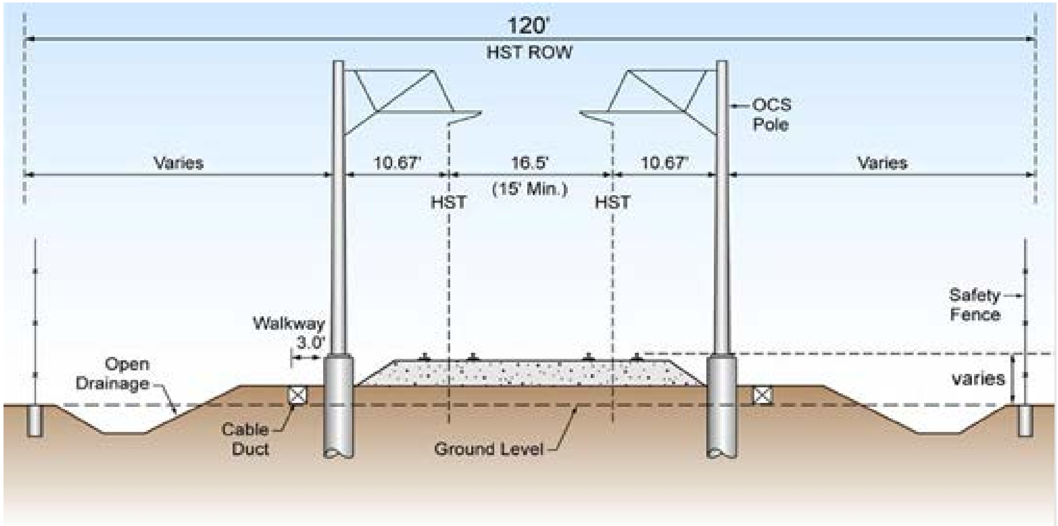


Figure 2-2
At-grade typical cross sections

2.1.2 Retained-Fill Profile

Retained-fill profiles (Figure 2-3) are used when it is necessary to narrow the right-of-way within a constrained corridor to minimize property acquisition or to transition between an at-grade and elevated profile. The guideway would be raised off the existing ground on a retained-fill platform made of reinforced walls, much like a freeway ramp. Short retaining walls would have a similar effect and would protect the adjacent properties from a slope extending beyond the rail guideway.

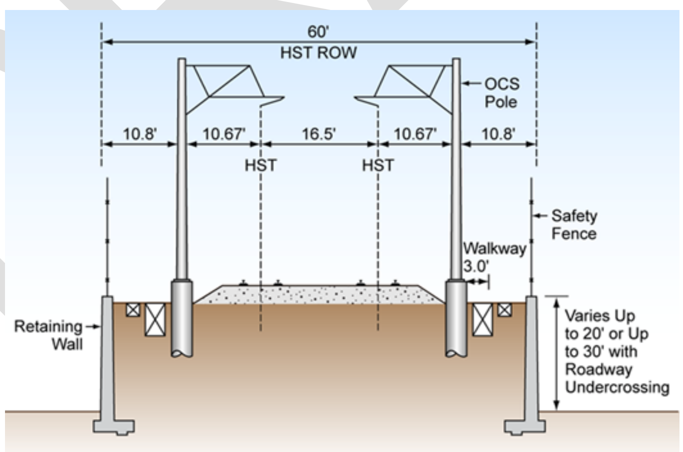


Figure 2-3
Retained-fill typical cross section

2.1.3 Retained-Cut Profile

Retained-cut profiles (Figure 2-4) are used when the rail alignment crosses under existing rail tracks, roads, or highways that are at-grade. This profile type is used only for short distances in

highly urbanized and constrained situations. In some cases, it is less disruptive to the existing traffic network to depress the rail profile under these crossing roadways. Retaining walls would typically be needed to protect the adjacent properties from a cut slope extending beyond the rail guideway. Retained-cut profiles are also used for roads or highways when it is more desirable to depress the roadway underneath an at-grade HST alignment.

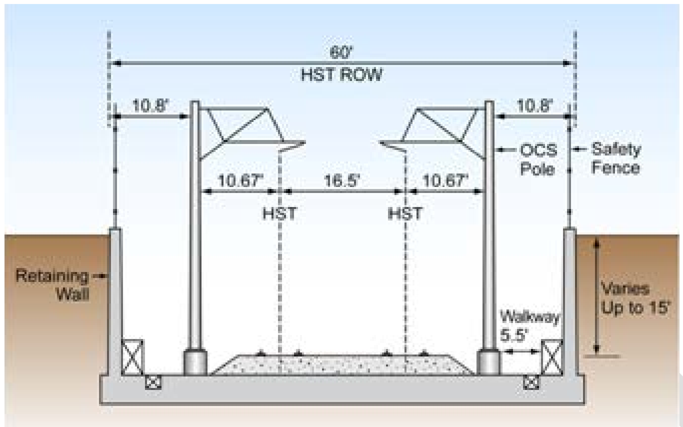


Figure 2-4
Retained-cut typical cross section

2.1.4 Elevated Profile

Elevated profiles (Figure 2-5) can be used in urban areas where extensive road networks must be maintained. An elevated profile must have a minimum clearance of approximately 16.5 feet over roadways and 24 feet over railroads. Pier supports are typically approximately 10 feet in diameter at the ground. Such structures could also be used to cross water bodies; even though the trackway might be at grade on either side, the width of the water channel could require a bridge at the same level, which would be built in the same way as the elevated profile.

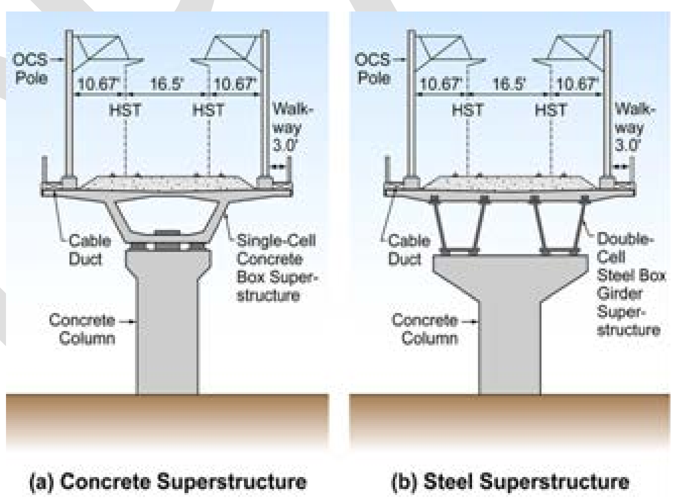


Figure 2-5
Elevated structure typical cross sections

2.2 Straddle Bents

When the HST elevated profile crosses over a roadway or railway on a very sharp skew (degree of difference from the perpendicular), a straddle bent ensures that the piers are outside of the functional/operational limit of the roadway or railway.

As shown in Figure 2-6, a straddle bent is a pier structure that spans (or "straddles") the functional/operational limit of a roadway, highway, or railway. Typical roadway and highway crossings that have a larger skew angle (i.e., the crossing is nearly perpendicular) generally use intermediate piers in medians and span the functional right-of-way. However, for small-skew-angle crossing conditions, median piers would result in excessively long spans that are not feasible. Straddle bents that clear the functional right-of-way can be spaced as needed (typically 110 feet apart) to provide feasible span lengths for bridge crossings at small skew angles.

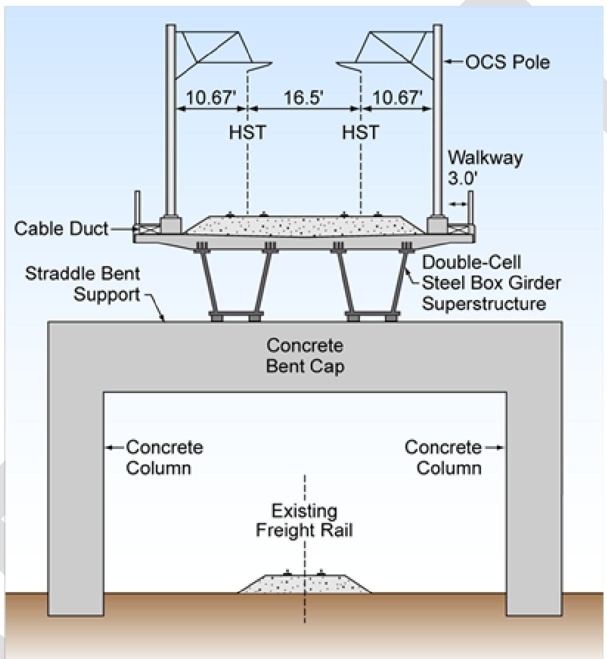


Figure 2-6
Straddle bent typical cross section

2.3 Grade Separations

A safely operating HST system consists of a fully grade-separated and access-controlled guideway. Unlike existing passenger and freight trains in the area, there would be no at-grade road crossings, nor would the HST system share its rails with freight trains. The following describes possible scenarios for HST grade separations:

- **Roadway overcrossings.** There are many roadway and state route facilities that currently cross at-grade with or over the BNSF railroad tracks. Figure 2-7 illustrates how a roadway would be grade-separated over both the HST and the railroad in these situations. Similar conditions occur when an at-grade HST alignment crosses rural roads adjacent to farmland. Figure 2-8 is an example of a typical roadway overcrossing of the HST tracks; these overcrossings would generally occur approximately every 2 miles to provide continued mobility for local residents and farm operations. Overcrossings would have two lanes, each with a width of 12 feet. The shoulders would be 4 to 8 feet wide, depending on average daily

traffic (ADT) volumes. The paved surface for vehicles would therefore range from 32 to 40 feet wide. Minimum clearance would be 27 feet over the HST. Specifications are based on county road standards.

- **Elevated HST road crossings.** In urban areas, it may be more feasible to raise the HST as shown previously in Figures 2-5 and 2-6. This is especially relevant in downtown urban areas where use of an elevated HST guideway would minimize impacts on the existing roadway system.
- **Roadway undercrossings**. HST alternatives may require undercrossings for the HST to travel over roadways. Figure 2-9 illustrates how a roadway would be grade-separated below the HST guideway.

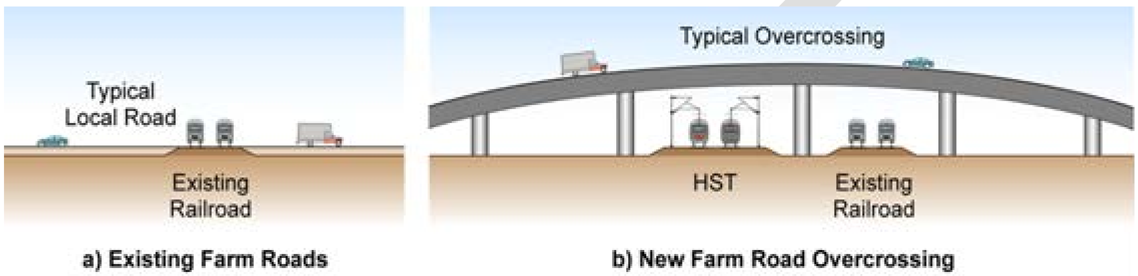


Figure 2-7
Replacing local roads with new overcrossings

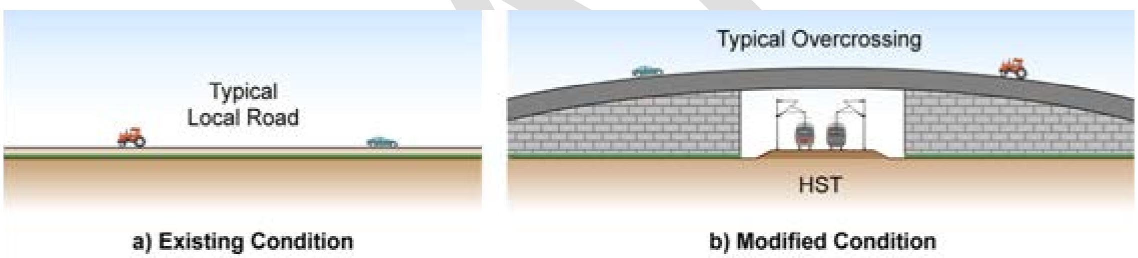


Figure 2-8
Replacing at-grade crossings with overcrossings

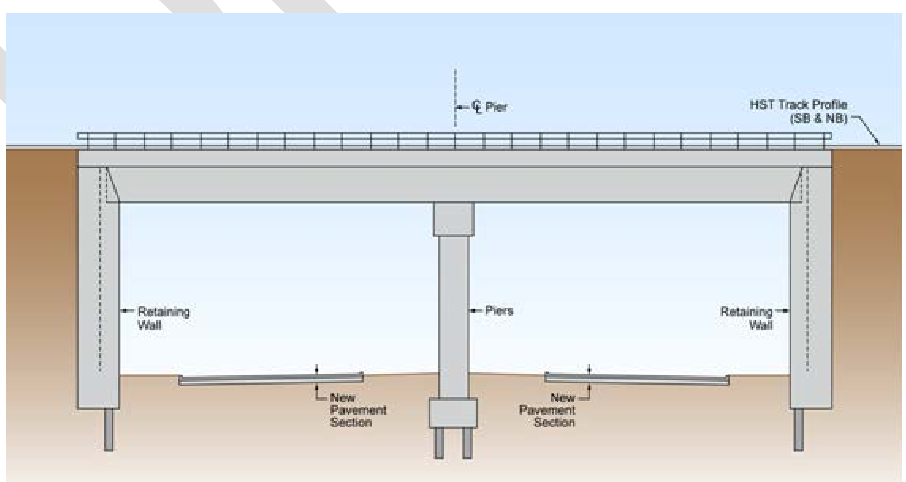


Figure 2-9
Typical cross section of roadway grade-separated beneath HST guideway

2.4 Traction Power Distribution

California's electricity grid would power the proposed HST system. The HST system is expected to require less than 1% of the state's future electricity consumption. The HST would be supplied with energy from the California grid, and it is not feasible to physically control the flow of electricity from particular sources. However, a 2008 study performed by Navigant Consulting, Inc. (Navigant Consulting, Inc. 2008) found that it would be feasible for the Authority to obtain the quantity of power required for the HST from 100% clean, renewable energy sources through a variety of mechanisms, such as by paying a clean-energy premium for the electricity consumed.

PP1 would not include the construction of a separate power source, although it would include the extension of power lines to a series of power substations positioned along the HST corridor. These power substations are needed to even out the power feed to the train system.

Trains would draw electric power from an overhead contact system, with the running rails acting as the other conductor. The contact system would consist of a series of mast poles approximately 23.5 feet higher than the top of the rail, with contact wires suspended from the mast poles between 17 and 19 feet from the top of the rail. The train would have an arm, called a pantograph, to maintain contact with this wire to provide power to the train. The mast poles would be spaced approximately every 200 feet along straight portions of the track down to every 70 feet in tight-turn track areas. The contact system would be connected to the substations, which are required at approximately 30-mile intervals. Statewide, the power supply would consist of a 2-by-25-kilovolt (kV) overhead contact system for all electrified portions of the statewide system. See Figure 2-10, which shows an example of an overhead contact system.

Figure 2-10
Example of an at-grade profile showing contact wire system and vertical arms of the pantograph power pickups

2.4.1 Traction Power Substations

Based on the HST system's estimated power requirements, each traction power substation (TPSS) would need to be approximately 32,000 square feet (200 feet by 160 feet) and be spaced at approximately 30-mile intervals.

TPSSs would have to accommodate the power substations and would require a substantial buffer area around them for safety purposes. For the Fresno to Bakersfield Section, electrical substations would be constructed at locations where high-voltage power lines cross the HST alignment. The TPSS could be screened from view with a wall or fence. Each TPSS site would have a 20-foot-wide access road (or easement) from the street access point to the protective fence perimeter at each parcel location. Each site would require a parcel of up to 2 acres. Each substation would include an approximately 450-square-foot control room (each alternative design includes these facilities, as appropriate).

Power would be supplied by Pacific Gas and Electric Company (PG&E) transmission lines. PG&E has indicated that existing lines may need to be reconstructed to serve PP1. This could consist of reconductoring transmission lines, or new power poles may need to be installed. When electrification of the system is required, PG&E would design and implement changes to their transmission lines, including completion of environmental review and clearance of the reconstruction of transmission lines.

2.4.2 Switching and Paralleling Stations

Switching and paralleling stations work together to balance the electrical load between tracks, and to switch power off or on to either track in the event of an emergency. Switching stations would be required at approximately 15-mile intervals, midway between the TPSSs. These stations would need to be approximately 9,600 square feet (120 feet by 80 feet). Paralleling stations would be required at approximately 5-mile intervals between the switching stations and the TPSSs. The paralleling stations would need to be approximately 8,000 square feet (100 feet by 80 feet). Each station would include an approximately 450-square-foot (18 feet by 25 feet) control room. TPSS, traction power switching, and paralleling stations are included in each alternative design as appropriate.

2.4.3 Backup and Emergency Power Supply Sources for Station and Facilities

During normal system operations, power would be provided by the local utility service and/or from the TPSS. Should the flow of power be interrupted, the system will automatically switch to a backup power source, through use of an emergency standby generator, an uninterruptable power supply, and/or a DC battery system.

For the Fresno to Bakersfield Section, permanent emergency standby generators are anticipated to be located at passenger stations and at the heavy maintenance facility (HMF) and terminal layup/storage and maintenance facilities. These standby generators are required to be tested (typically once a month for a short duration) in accordance with National Fire Protection Association 110/111 to ensure their readiness for backup and emergency use. If needed, portable generators could also be transported to other trackside facilities to reduce the impact on system operations.

2.4.4 Signaling and Train-Control Elements

Signaling and train control elements include signal huts/bungalows within the right-of-way that house signal relay components and microprocessor components, cabling to the field hardware and track, signals, and switch machines on the track. These would be installed near track switches, and would be grouped with other power, maintenance, station, and similar HST facilities where possible.

2.5 Track Structure

The track structure would consist of either a direct fixation system (with track, rail fasteners, and slab), or ballasted track, depending on local conditions and decisions to be made in later design. Ballasted track requires more frequent maintenance than slab track, as described below, but is less expensive to install.

For purposes of environmental review, slab track is assumed for long HST structures and ballasted track is assumed for at-grade sections and short HST structures. A subsequent environmental review will be performed if additional design and technical review result in a significant change in the type of track structure.

2.6 Maintenance Facilities

The California HST System includes three types of maintenance facilities. Each section would have maintenance-of-way facilities and a number of overnight layover and servicing facilities

would be distributed throughout the system. In addition, the HST system would have a single HMF.

2.6.1 Maintenance-Of-Way Facilities

Maintenance-of-way facilities provide for equipment, materials, and replacement parts storage, and support quarters and staging areas for the HST system subdivision maintenance personnel. Each subdivision would cover about 150 miles; the maintenance-of-way facility would be centrally located in the subdivision.

The facility would sit on a linear site next to the HST tracks with a maximum width of two tracks, and would be approximately 0.75 mile long, for a total size of 26 acres. One maintenance-of-way facility would be needed in the Fresno to Bakersfield Section. This facility would be co-located with the HMF, if an HMF is provided in PP1. If an HMF is not provided in PP1, the maintenance-of-way facility would be located at one of the potential HMF sites identified in this FEIR/FEIS (see Section 2.4.6, Proposed Heavy-Maintenance Facility Locations). Additionally, for lengths of mainline track that are relatively distant from stations with refuge tracks and/or maintenance-of-way facilities, a refuge track would be sited to provide temporary storage of work trains as they perform maintenance on or near the track. The track would be approximately 1,600 feet long and would be connected to the main line. Access by road for work crews would be required, along with enough space to park work crew vans while working from the site and to drive the length of the track. The track and access area would be within the fenced and secure area of the HST line. The Fresno to Bakersfield Section would require a refuge track in the vicinity of Corcoran.

3.0 Summary of Design Features

Figures 2-11 through 2-14 illustrate the route of PP1. The alternative evaluated represents a preliminary engineering design level and is summarized in Table 2-3.

A key performance measure is the travel time between the major destinations. The state-legislated HST System requirement is to provide for a nonstop service travel time between San Francisco and Los Angeles of 2 hours and 40 minutes, as well as a 2-hour and 20-minute trip between Los Angeles Union Station and Sacramento.

Table 2-3
Design Features of PP1

Design Option	Preferred Alternative
Total length (linear miles)	100
At-grade profile (linear miles)	70
Elevated profile (linear miles)	29
Below-grade profile (linear miles)	1
Number of Straddle Bents	0
Number of Railroad Crossings	7
Number of Major Water Crossings	7
Number of Road Crossings	136
Number of Roadway Closures	44
Number of Roadway Overcrossings and Undercrossings	43
*Note: Totals may not add up due to rounding.	

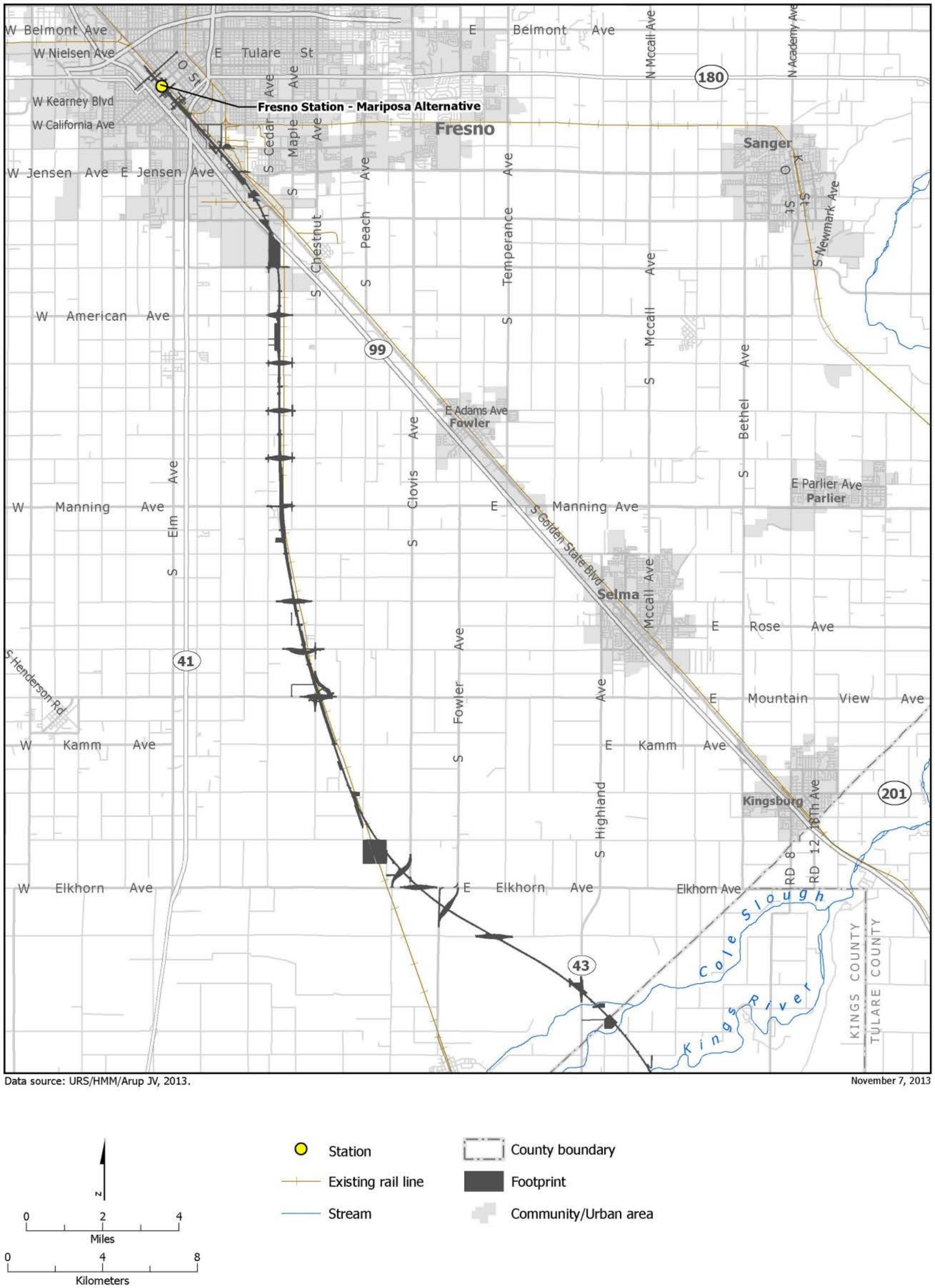


Figure 2-11
PP1 – Fresno County

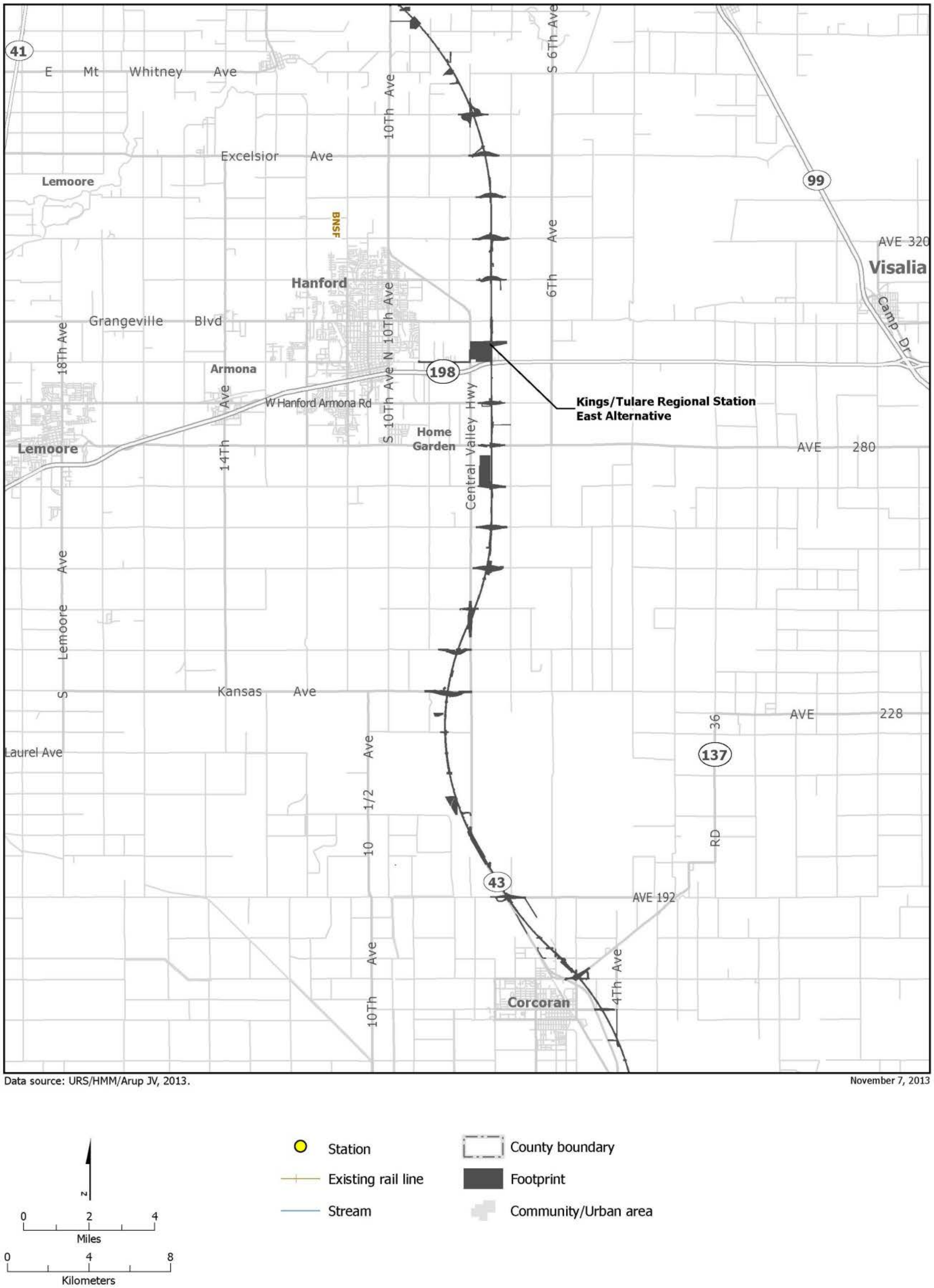


Figure 2-12
PP1 – Kings County

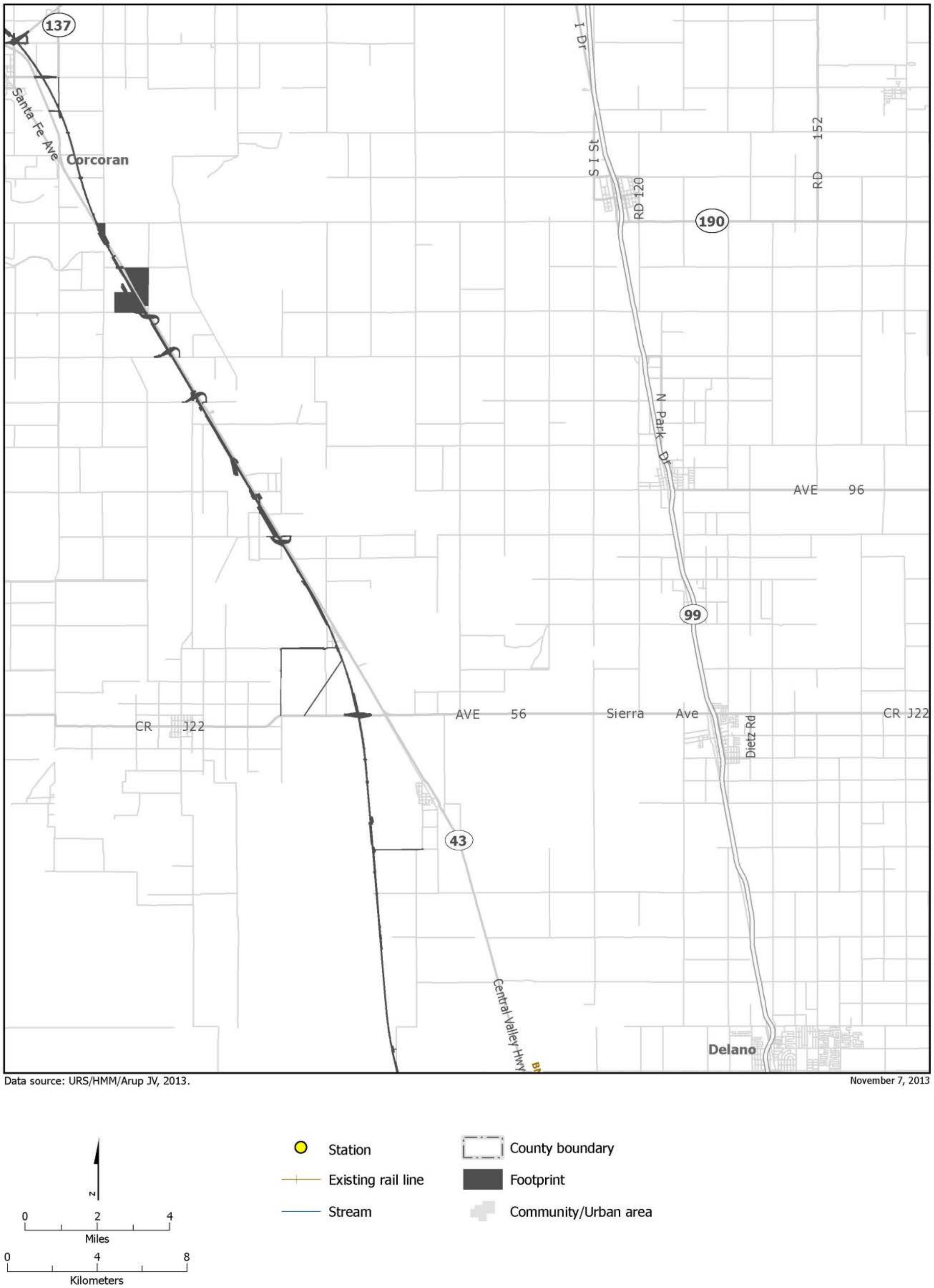


Figure 2-13
PP1 – Tulare County

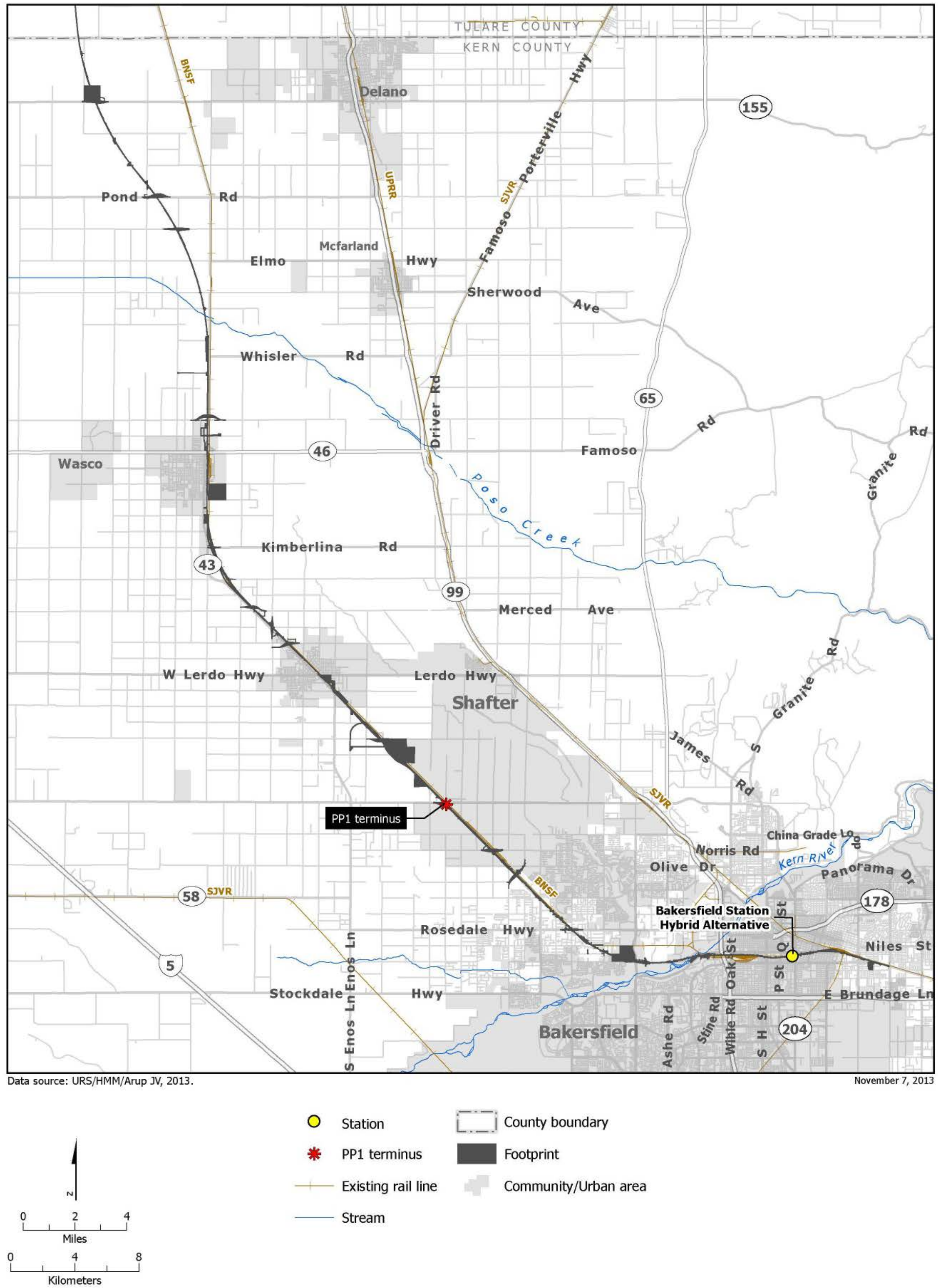


Figure 2-14
PP1 – Kern County

4.0 Construction Plan

This section summarizes the general approach to building the HST system, including activities associated with pre-construction and construction of major system components. The construction plan developed by the Authority and described below would maintain eligibility for federal American Recovery and Reinvestment Act funding.

4.1 General Approach

Upon receiving the required environmental approvals and securing needed funding, the Authority would begin implementing its construction plan. In general, the procurement would address the following:

- Civil/structural infrastructure, including design and construction of passenger stations, maintenance facilities, and right-of-way facilities.
- Trackwork, including design and construction of direct fixation track and sub-ballast, ballast, ties and rail installation, switches, and special trackwork.
- Core systems, such as traction power, train controls, communications, the operations center, and the procurement of rolling stock.

During peak construction periods, work is envisioned to be under way at several locations along the route, with overlapping construction of various elements. Working hours and workers present at any time would vary depending on the activities being performed. The overall schedule for construction is provided in Table 2-4.

Table 2-4
Approximate Construction Schedule[a,b]

Activity	Tasks	Duration
Right-of-way Acquisition	Proceed with right-of-way acquisitions once State Legislature appropriates funds in annual budget	March 2013–March 2015
Survey and Preconstruction	Locate utilities, establish right-of-way and project control points and centerlines, establish or relocate survey monuments	March 2013–October 2013
Mobilization	Safety devices and special construction equipment mobilization	April 2014–July 2014
Site Preparation	Utilities relocation; clearing/grubbing right-of-way; establishment of detours and haul routes; preparation of construction equipment yards, stockpile materials, and precast concrete segment casting yard	July 2014–November 2014 (two site preparation periods)
Earth Moving	Excavation and earth support structures	November 2014–November 2016
Construction of Road Crossings	Surface street modifications, grade separations	November 2014–November 2016
Construction of Aerial Structures	Aerial structure and bridge foundations, substructure, and superstructure	November 2014–January 2017

Table 2-4
Approximate Construction Schedule[a,b]

Activity	Tasks	Duration
Track Laying	Includes backfilling operations and drainage facilities	November 2016–July 2017
Systems	Train control systems, overhead contact system, communication system, signaling equipment	November 2016–May 2019
Demobilization	Includes site cleanup	October 2016–April 2017 (two demobilization periods)
HMF Phase 1[c]	Test Track Assembly and Storage	May 2017–November 2018
HMF Phase 2[c]	Test Track Light Maintenance Facility	May 2017–December 2018
Maintenance-of-Way Facility	Potentially collocated with HMF[a]	May 2017–November 2018
HMF Phase 3[c]	Heavy Maintenance Facility	May 2017–November 2018
HST Stations	Demolition, site preparation, foundations, structural frame, electrical and mechanical systems, finishes	Fresno: June 2017–April 2020 Kings/Tulare Regional: June 2020–June 2023[d] Bakersfield: June 2018–April 2021

Notes:

a Based on a two-phase implementation of the project: first construction will meet the ARRA funding deadline and be completed in 2017; the remainder of the Initial Operating Segment will be completed by 2022 per the Business Plan and based on anticipated funding flow.

b Final design will be completed by the design-build contractor following contract award and issuance of the Notice to Proceed for each construction package.

c HMF would be sited in either the Merced to Fresno or Fresno to Bakersfield Section.
d Right-of-way would be acquired for the Kings/Tulare Regional Station; however, the station itself would not be part of initial construction.

Acronym:

TBD = to be determined

The Authority intends to build the project using sustainable methods that:

- Minimize the use of nonrenewable resources.
- Minimize the impacts on the natural environment.
- Protect environmental diversity.
- Emphasize using renewable resources in a sustainable manner.

4.2 Pre-Construction Activities

During final design, the Authority and its contractor would conduct a number of pre-construction activities to determine how best actual construction should be staged and managed. Those activities include the following:

- Conducting geotechnical investigations, which would focus on defining precise geology, groundwater, seismic, and environmental conditions along the alignment. The results of this work would guide final design and construction methods for foundations, underground structures, tunnels, stations, grade crossings, aerial structures, systems, and substations.
- Identifying staging areas and precasting yards, which would be needed for the casting, storage, and preparation of precast concrete segments, temporary spoil storage, workshops, and the temporary storage of delivered construction materials. Field offices and/or temporary jobsite trailers would also be located at the staging areas.
- Initiating site preparation and demolition, such as clearing, grubbing, and grading, followed by the mobilization of equipment and materials. Demolition would require strict controls to ensure that adjacent buildings or infrastructure are not damaged or otherwise impacted by the demolition efforts.
- Relocating utilities, where the contractor would work with the utility companies to relocate or protect in place such high-risk utilities as overhead tension wires, pressurized transmission mains, oil lines, fiber optics, and communications prior to construction.
- Implementing temporary, long-term, and permanent road closures to re-route or detour traffic away from construction activities. Handrails, fences, and walkways would be provided for the safety of pedestrians and bicyclists.
- Locating temporary batch plants, which would be required to produce Portland cement or asphaltic concrete needed for roads, bridges, aerial structures, retaining walls, and other large structures. The facilities generally consist of soils containing fly ash, lime, and cement; heated tanks of liquid asphalt; sand and gravel material storage areas; mixing equipment; aboveground storage tanks; and designated areas for sand/gravel truck unloading, concrete truck loading, and concrete truck washout. The contractor would be responsible for implementing procedures for reducing air emissions, mitigating noise impacts, and reducing the discharge of potential pollutants into storage drains or watercourses from the use of equipment, materials, and waste products.
- Conducting other studies and investigations, as needed, such as local business surveys to identify business usage, delivery, shipping patterns, and critical times of the day or year for business activities. This information would help develop construction requirements and worksite traffic control plans, and will identify potential alternative routes, cultural resource investigations, and historic property surveys.

4.3 Major Construction Activities

Three major types of construction activities are briefly described below.

4.3.1 Earthwork

Earth support is an important factor in constructing deep excavations that will be encountered on several alignment sections. It is anticipated that the following excavation support systems may be used along the route. There are three general excavation support categories, which are described below.

- Open Cut Slope. Open cut slope is used in areas where sufficient room is available to open-cut the area and slope the sides back to meet the adjacent existing ground. The slopes are designed similar to any cut slope, taking into account the natural repose angle of adjacent ground material and global stability.

- Temporary. Temporary excavation support structures are designed and installed to support vertical or near-vertical faces of the excavation in areas where room to open-cut does not exist. This structure does not contribute to the final load-carrying capacity of a tunnel structure and is either abandoned in place or dismantled as the excavation is being backfilled. Generally, it consists of solder piles and lagging, sheet pile walls, slurry walls, secant piles, or tangent piles.

- Permanent. Permanent structures are designed and installed to support vertical or near vertical faces of the excavation in areas where room to open-cut does not exist. This structure forms part of the permanent final structure. Generally it consists of slurry walls, secant piles, or tangent pile walls.

4.3.2 Bridge and Viaduct Construction

In a similar fashion to existing high-speed rail systems around the world, it is anticipated that the elevated guideways are anticipated to be designed and built as single-box segmental girder construction. Where needed, other structural types will be considered and used, including steel girders, steel truss, and cable-supported structures.

- Foundations. A typical aerial structure foundation pile cap is supported by an average of four large-diameter bored piles with diameters ranging from 5 to 9 feet. Depth of piles depends on geotechnical site conditions. Pile construction can be achieved by using rotary drilling rigs, and either bentonite slurry or temporary casings may be used to stabilize pile shaft excavation. The estimated pile production rate is 4 days per pile installation. Additional pile installation methods available to the contractor include bored piles, rotary drilling cast-in-place piles, driven piles, and a combination of pile jetting and driving. When the piles are complete, pile caps can be constructed using conventional methods. For pile caps constructed near existing structures such as railway, bridges, and underground drainage culverts, temporary sheet piling can be used to minimize disturbances to adjacent structures. It is anticipated that sheet piling installation and extraction is achieved using hydraulic sheet piling machines.

- Substructure. Viaducts with pier heights ranging from 20 to 90 feet may be constructed using conventional jump form and scaffolding methods. A self-climbing formwork system may be used to construct piers and portal beams over 90 feet high. The self-climbing formwork system is equipped with a winched lifting device, which is raised up along the column by hydraulic means with a structural frame mounted on top of the previous pour. In general, a 3-day cycle for each 12-foot pour height can be achieved. The final size and spacing of the piers depends on the type of superstructure and spans they are supporting.

- Superstructure. It will be necessary to consider the loadings, stresses, and deflections encountered during the various intermediate construction stages, including changes in static scheme, sequence of tendon installation, maturity of concrete at loading, and load effects from erection equipment. As a result, the final design will depend on the contractor's means and methods of construction, and can include several different methods, such as a span-by-span, incrementally launched, progressive cantilever, and balanced cantilever.

4.3.3 Railroad Systems Construction

The railroad systems are to include trackwork, traction electrification, signaling, and communications. After completion of earthwork and structures, trackwork is the first rail system to be constructed, and it must be in place to start traction electrification and railroad signalizing installation.

Trackwork construction generally requires the welding of transportable lengths of steel running onto longer lengths (approximately 0.25 mile), which are placed in position on crossties or track slabs and field-welded into continuous lengths.

Tie and ballast track construction typically requires that crossties and ballasts be distributed along the trackbed by truck or tractor. In sensitive areas such as where the HST is parallel or near to streams, rivers, or wetlands, and in areas of limited accessibility, this operation may be accomplished by using the established right-of-way with material delivery via the constructed rail line.

An alternative to ballasted track construction is using a slab track system. Slab track construction techniques include using slipped form paving machines, top-down construction, grouted precast panels set on a poured slab, or conventional paving machines. Slab track may be built directly on tunnel inverts, at grade over prepared subgrade, or on aerial structures.

Traction electrification equipment to be installed includes traction power substations and the overhead contact system. Traction power substations are typically fabricated and tested in a factory, then delivered by tractor-trailer to a prepared site next to the alignment. It is assumed that substations are to be built every 30 miles along the alignment. The overhead contact system is assembled in place over each track, and includes poles, brackets, insulators, conductors, and other hardware.

Signaling equipment to be installed includes wayside cabinets and bungalows, wayside signals (at interlocking), switch machines, insulated joints, impedance bounds, and connecting cables. The equipment will support automatic train protection, automatic train control, and positive train control to control train separation, routing at interlocking, and speed.

5.0 Permitting Phase 1 Detailed Description

This section provides a detailed description of the PP1. The preliminary engineering design drawings show the track alignments, profiles, structures, typical sections, construction use areas, and other preliminary design information included as Attachment 3. They are also available on the Authority's web site (www.hsr.ca.gov).

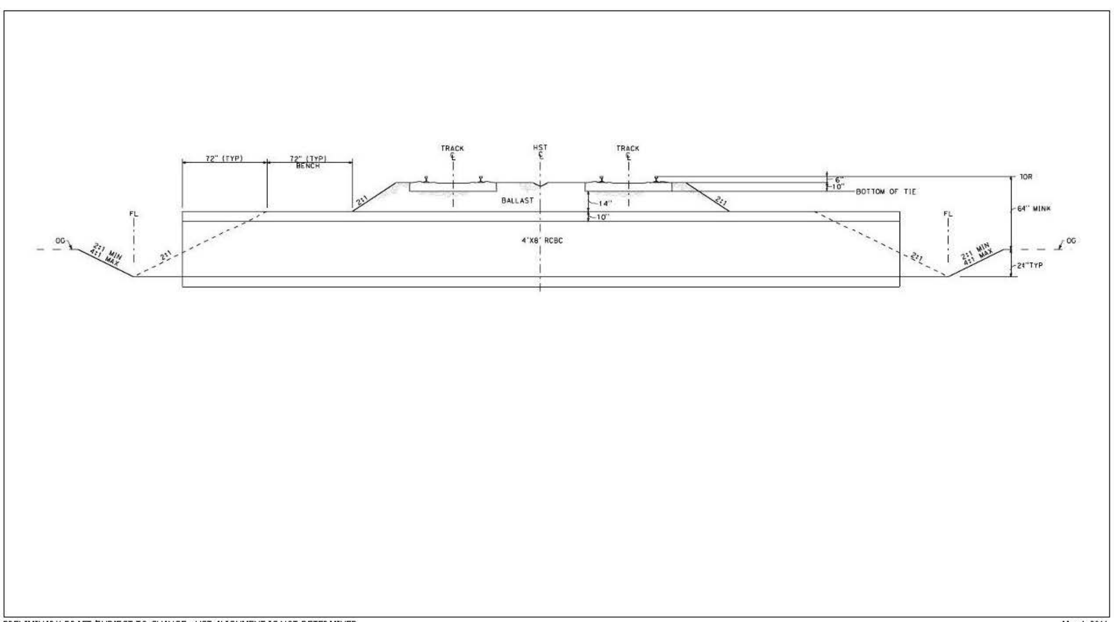
5.1 Alignment Requirements

The alignment for PP1 traverses the urban downtown area of the City of Fresno. It is generally adjacent to the BNSF Railway. Some of the main requirements are described below.

- Frontage Road and Local Roadway Crossings: As the alignment travels through rural regions, it can impact existing local frontage roads used by small communities and farm operations. Where these frontage roads are impacted by the HST alignment, they would be shifted and reconstructed to maintain their function. Where roads are perpendicular to the proposed HST, over- or undercrossings are planned at minimum every 2 miles. In between, some roads may be closed. These are identified on maps, and a detailed list is provided in Appendix 2-A of the FEIR/FEIS.
- Irrigation and Drainage Facilities: The HST alignment would impact some existing drainage and irrigation facilities. Depending on the extent of the impact, existing facilities would be modified, improved, or replaced as needed to maintain existing drainage and irrigation functions, and to support HST drainage requirements.
- Wildlife Crossing Structures: Wildlife crossing opportunities would be available through a variety of engineered structures. In addition to dedicated wildlife crossing structures, wildlife

crossing opportunities would also be available at aerial structure portions of the alignment, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large diameter [60 to 120 inches] culverts, and paired 30-inch culverts).

- Dedicated wildlife crossing structures would be provided from approximately Cross Creek (Kings County) south to PP1's endpoint (Tulare County) in at-grade portions of the railroad embankment at approximately 0.3-mile intervals. Where bridges, aerial structures, and road crossings coincide with proposed dedicated wildlife crossing structures, such features would serve the function of, and supersede the need for, dedicated wildlife crossing structures.
- The preliminary wildlife crossing structure design consists of modified culverts in the embankment that would support the HST tracks (Figure 2-15). The typical culvert from end-to-end would be 72 feet long (crossing structure distance), would span a width of approximately 8 feet (crossing structure width), and would provide 4 feet of vertical clearance (crossing structure height). Additional wildlife crossing structure designs could include circular or elliptical pipe culverts, and larger (longer) culverts with crossing structure distances of up to 100 feet. However, any changes to wildlife crossing structure design must be constrained by a minimum of 3 feet of vertical clearance (crossing structure height) and must meet or exceed the minimum 0.41 openness factor.
- Additionally, dedicated wildlife crossing structures would be placed to the north and south of each of the following river/creek crossings: Kings River, St. Johns Cut (Dutch Slough), Cole Slough, Cross Creek, Tule Creek, and Deer Creek. These wildlife crossing structures would be placed between 100 and 500 feet from the banks of each riparian corridor.
- Operational Facilities: HST operational requirements require TPSSs, switching stations, paralleling stations, and underground or overhead power transmission lines. Working in coordination with power supply companies and per design requirements, the Authority and FRA have identified frequency and right-of-way requirements for these facilities.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
May 4, 2011

Figure 2-15
Typical design for wildlife crossing culvert

5.2 BNSF Adjacency

An important objective of the project is to align HST tracks next to existing transportation corridors. PP1 is designed to follow the existing BNSF Railway corridor, next to the BNSF mainline right-of-way, as closely as practicable. Minor deviations from the BNSF Railway route are necessary to accommodate design requirements; namely, wider curves are needed to accommodate the speed of the HST compared to the existing lower-speed freight line track alignment). PP1 would not follow the BNSF Railway right-of-way between approximately Elk Avenue in Fresno County and Nevada Avenue in Kings County. Instead, the alignment would curve to the ~~west~~ east on the northern side of the Kings River and away from the city of Hanford, and would rejoin the BNSF Railway near the city of Corcoran, as shown on Figure 2-12. PP1 does not follow the BNSF Railway right-of-way through Allensworth, which begins at Avenue 84 and rejoins the BNSF–Through Allensworth Alternative at Elmo Highway.

PP1's cross sections include provisions for a 102-foot separation of the HST track centerline from the BNSF Railway track centerline, as well as separations that include swale or berm protection, or a wall where the HST tracks are closer. Figure 2-16 shows cross sections of these various configurations where there would not be a shared right-of-way with BNSF. Figure 2-17 shows the same cross sections illustrating a shared right-of-way with BNSF; the design guidelines recognize BNSF as a potential shared corridor partner, which in some locations could reduce the required horizontal separation of the HST from the BNSF Railway facility by as much as 25 feet, assuming the appropriate intrusion protection (barrier) is provided.

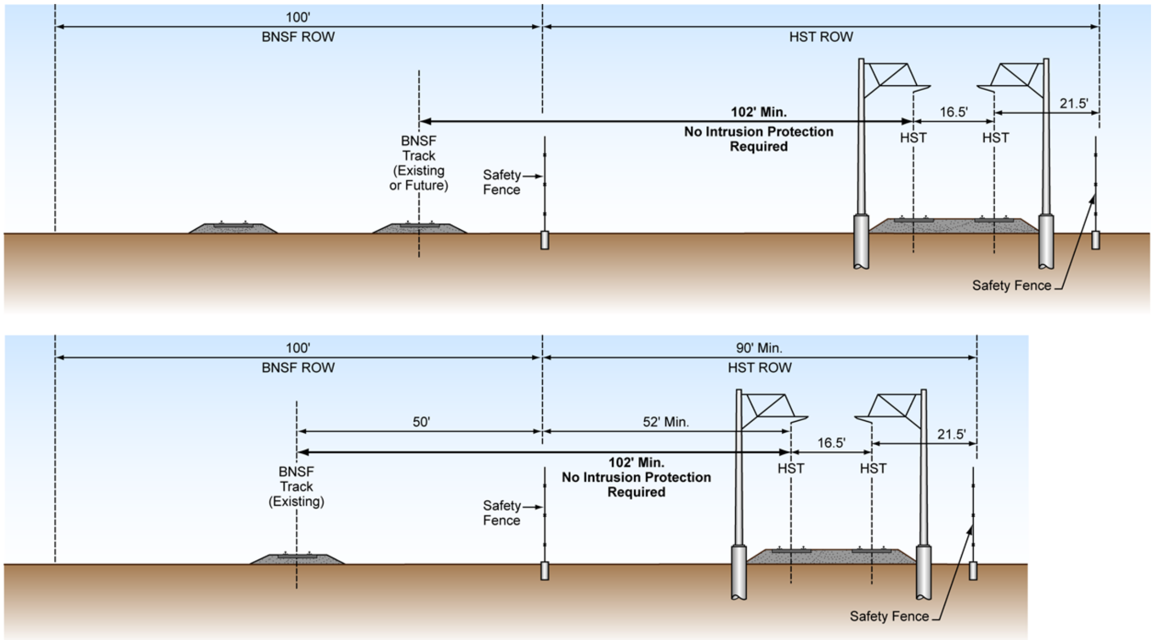
5.3 North-South Alignment

This section describes PP1 as it traverses from north to south. Appendix 2-A of the FEIR/FEIS provides additional detailed information about HST crossing roadways within these vicinities.

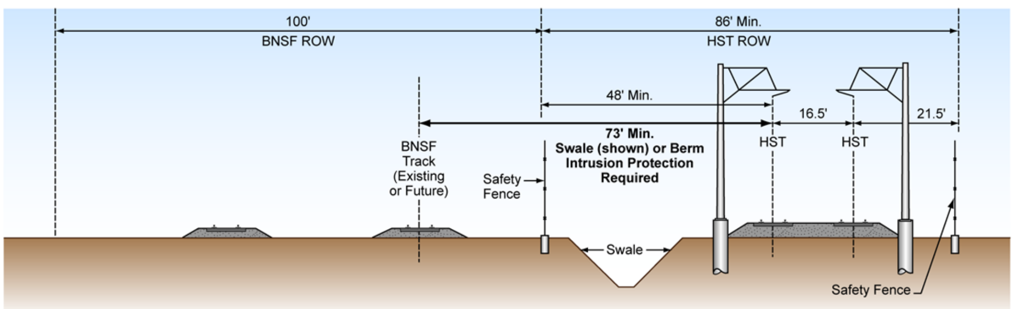
5.3.1 Fresno County

PP1 begins at SR 41 adjacent to the western side of the UPRR right-of-way in the vicinity of X Street. The alignment would be at grade and would cross the Fresno Bee railroad spur, rendering it unusable. The alignment would continue southeast through Fresno on the western side of the UPRR until reaching East Jensen Avenue. The alignment would be below grade in a shallow trench as it travels underneath East Jensen Avenue, and would then curve to the south and be elevated over Golden State Boulevard and SR 99. The alignment returns to grade and joins the BNSF Railway right-of-way on its western side at East Malaga Avenue, south of Fresno.

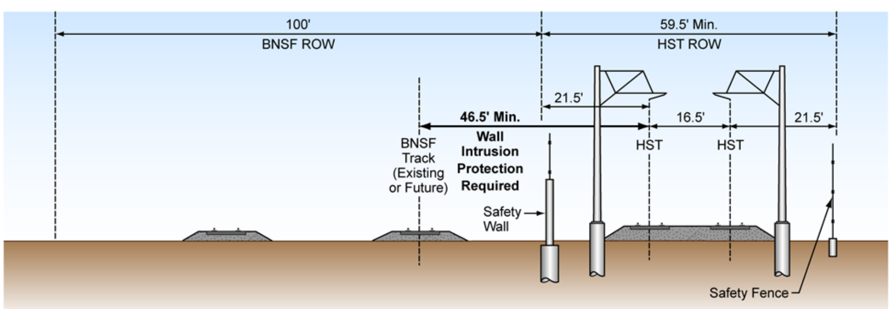
PP1 would continue through Fresno County along the BNSF Railway right-of-way in an area composed mostly of agricultural land. Approximately 17 miles of track would be in Fresno County. Nearly all of the alignment would be at-grade. The alignment would be at-grade with bridges where it crosses Cole Slough and the Kings River Complex into Kings County to the east of Laton. ~~These bridges would clear the Cole Slough and Kings River levees by approximately 3 feet.~~ Dedicated wildlife crossing structures would be placed between 100 and 500 feet to the north and south of Cole Slough.



(a) BNSF Centerline Track-to-Track Separation 102 Feet or More
(No Intrusion Protection Required)

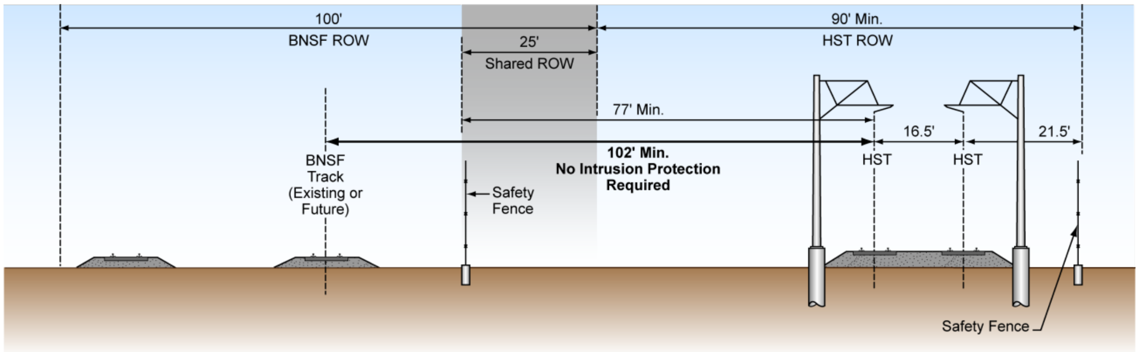


(b) BNSF Centerline Track-to-Track Separation 72 Feet to 102 Feet
(Swale or Berm Intrusion Protection Required)

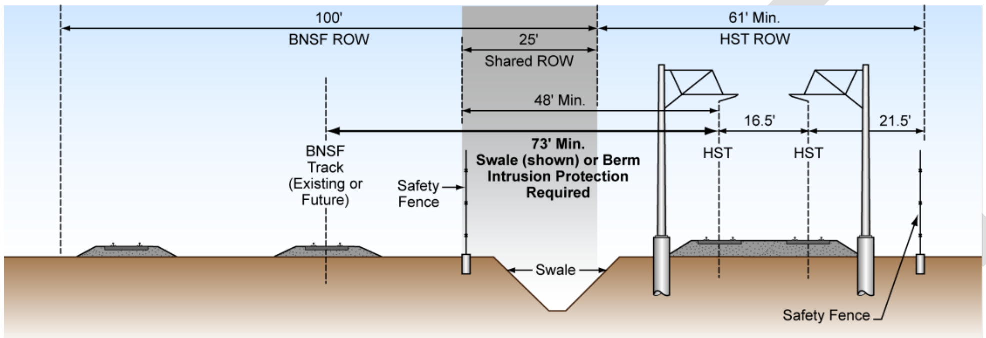


(c) BNSF Centerline Track-to-Track Separation 46.5 Feet (Min.) to 72 Feet
(Wall Intrusion Protection Required)

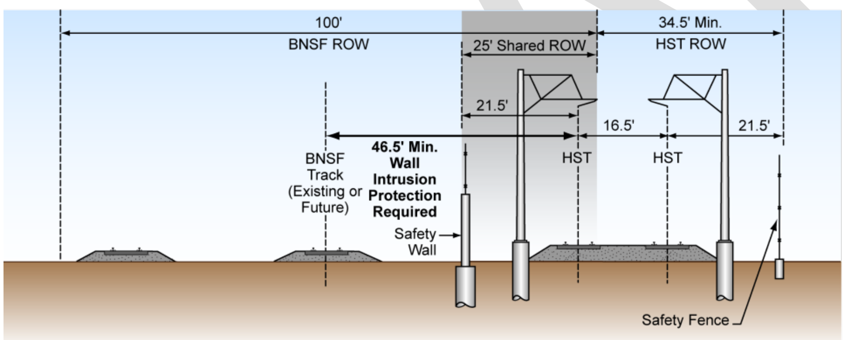
Figure 2-16
BNSF Alternative Showing separate rights of way



(a) BNSF Centerline Track-to-Track Separation 102 Feet or More
(No Intrusion Protection Required)



(b) BNSF Centerline Track-to-Track Separation 72 Feet to 100 Feet
(Swale or Berm Intrusion Protection Required)



(c) BNSF Centerline Track-to-Track Separation 46.5 Feet (Min.) 72 Feet
(Wall Intrusion Protection Required)

Figure 2-17
BNSF Alternative showing opportunity for shared right-of-way

5.3.2 Kings County

Approximately 30 miles of PP1 would be in Kings County. The alignment would pass east of the city of Hanford, parallel to and approximately 0.5 mile east of SR 43 (Avenue 8). South of Hanford in the vicinity of Idaho Avenue, the BNSF Alternative would curve to the west and then south toward the BNSF Railway right-of-way. The alignment ~~was refined in this area to avoid special aquatic features~~ north of Corcoran ~~and east of the BNSF Railway~~was refined east of SR 43. The alignment would rejoin the BNSF Railway right-of-way on its western side just north of Corcoran and cross over it to bypass Corcoran to the east at grade. The majority of this part of the alignment would pass through agricultural land.

A total of 5.5 miles of track within Kings County would be elevated. The first elevated portion would be built just east of the city of Hanford, and would span a length of 2.5 miles, beginning just south of Fargo Avenue and ending just north of Houston Ave. This portion of the alignment would pass over the San Joaquin Valley Railroad and SR 198. The structure would reach a height of approximately 48 feet above ground.

The alignment would continue at grade south of Hanford Armona Road for approximately 10 miles, where it would again ascend onto an elevated structure over Cross Creek and the BNSF Railway right-of-way. The structure would span a length of approximately 1.5 miles, beginning just before Cross Creek and returning to grade just before Nevada Avenue. The elevated structure would reach a maximum elevation of 45 feet. The alignment would then continue at grade for approximately 5 miles, where it would again ascend onto an elevated structure over a BNSF Railway spur at the southern end of the city of Corcoran. This structure span would be approximately 1.5 miles long.

Dedicated wildlife crossing structures would be provided from approximately Cross Creek south to the Tulare County line in at-grade portions of the railroad embankment at intervals of approximately 0.3 mile. Additionally, dedicated wildlife crossing structures would be placed between 100 and 500 feet to the north and south of each of the following river/creek crossings: St. Johns Cut (Dutch Slough), Kings River, and Cross Creek.

5.3.3 Tulare County

PP1 crosses approximately 25 miles of Tulare County. The alignment travels through the county on a southeast course entering the county west of Scofield Ave. The majority of the alignment would be at grade, with only a combined total of 2 miles elevated where the alignment crosses the Tule River, and then both the Alpaugh railroad spur from the BNSF Railway and Deer Creek. The elevated structure would reach a height of approximately 53 feet. This alignment would cross over Lakeland Canal. The alignment was refined over the course of environmental studies to reduce impacts to wetlands and orchards.

Dedicated wildlife crossing structures would be provided along at-grade portions of the railroad embankment at intervals of approximately 0.3 mile. Additionally, PP1 would include dedicated wildlife crossing structures placed between 100 and 500 feet to the north and south of each of the following river/creek crossings: Tule River and Deer Creek.

5.3.4 Kern County

PP1 would cross approximately 34 miles of Kern County and would pass through the cities of Wasco and Shafter, ending south of Shafter at 7th Standard Road and SR 43. It would closely follow the western side of the BNSF Railway until just south of Wasco, where it would cross over to the eastern side of the BNSF Railway tracks. The alignment would continue on the eastern side of the BNSF Railway right-of-way through Shafter and then cross over once more to the western side of the BNSF Railway right-of-way. Within this portion of the alignment, approximately 27 miles would be at grade, while the remainder of the alignment would be elevated. There would be three elevated sections along this segment of the BNSF Alternative. The first would cross Poso Creek north of Wasco. The other two elevated sections would be in the cities of Wasco and Shafter.

The elevated structure crossing Poso Creek between Sherwood Avenue and Whisler Road would be approximately 130 feet long. It would reach a maximum height of approximately 30 feet.

The second elevated structure would begin at Gromer Street, pass through Wasco for a distance of about 3 miles, and return to grade just south of Prospect Avenue. It would reach a height of

approximately 50 feet to the top of rail. From Prospect Avenue, the alignment would continue at grade for approximately 4.5 miles to about Madera Avenue where it would again ascend onto an elevated structure.

The alignment would be on an elevated structure through Shafter for a distance of about 3.5 miles between Madera Avenue and Cherry Avenue. This structure would reach a maximum height of approximately 68 feet and would return to grade at Cherry Avenue.

Dedicated wildlife crossing structures would be provided in at-grade portions of the railroad embankment at intervals of approximately 0.3 mile from the Kings County line to as far south as Poso Creek.

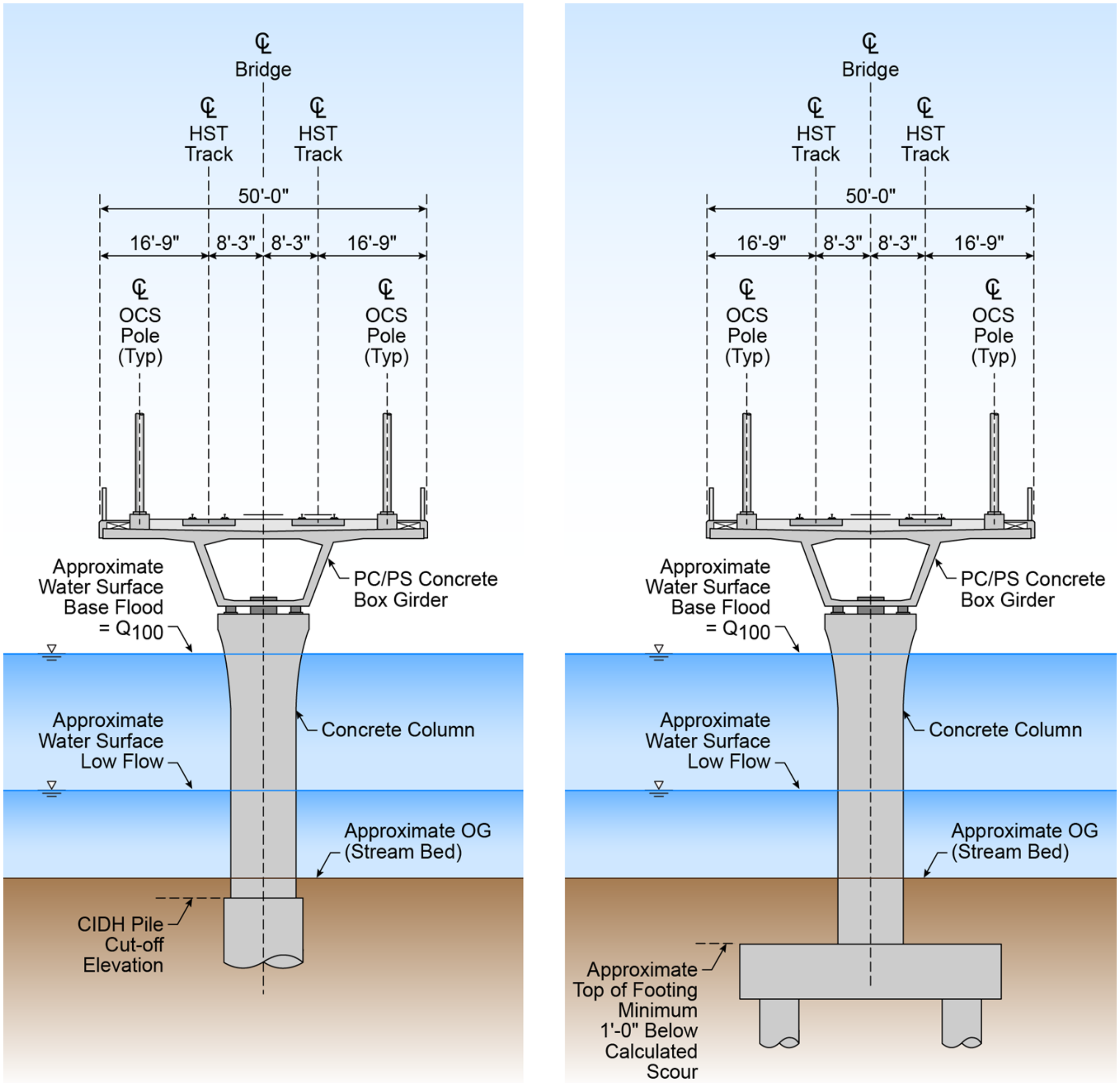
6.0 Proposed Crossing Approaches for PP1

The following identifies the proposed construction approach associated with crossing existing water features within PP1. Water features (total number of features indicated in parentheses by category) to be crossed include the following:

- River and Creek Crossings (7)
- Other Constructed watercourses such as ditches and canals (120)
- Depressional aquatic features, including vernal pools, emergent wetlands, and seasonal wetlands (50)
- Constructed retention/detention basins and reservoirs (47)

6.1 River and Creek Crossings

The proposed river and creek crossings (Kings River, Cross Creek, Tule River, Deer Creek, and Poso Creek) would be accomplished by constructing an elevated truss superstructure to safely span the river. The soffit (the lowest portion of the structure spanning the waterway) would be above the FEMA-designated 100-year base flood elevation flow to permit passage of flood flows. The elevated structure or guideway that crosses these rivers and creeks is anticipated to be supported by one of two basic foundation types: single large-diameter (12- to 14-foot), cast-in-drilled-hole (CIDH) piles with reinforced concrete column extensions; or a reinforced concrete pile footing supported by four or more 8-inch diameter CIDH piles (see Figure 2-18). The pre-cast span-by-span segmental method is the proposed method to build the concrete bridge spans associated with elevated sections. After completion, each concrete pile is anticipated to have a permanent impact of less than 0.05 acre.



(a) PC/PS Concrete Box Girder on CIDH Pile
(b) PC/PS Concrete Box Girder on CIDH Pile Footing

Figure 2-18
River Crossing – Typical Sections

As specified in the Biological Assessment (BA), construction of aerial structures is proposed to begin in summer 20XX, with in-stream work occurring from June 1 to October 15. Construction is anticipated to take approximately four construction seasons, including two seasons of near-water or, at times, in-water work (depending on flow) and an additional two seasons for construction of upland piers and bridge decks. Staging areas for construction equipment will be located outside sensitive biological resources, including habitat for special-status species, habitats of concern (e.g., waters of the U.S. wetlands, riparian communities), and wildlife movement corridors, to the maximum extent possible.

In-stream work will be limited to that required to install elements required for temporary falsework, support piles, and the superstructure, using equipment positioned outside and within the river channel, as necessary. Temporary falsework is anticipated to require the installation and removal of 2-foot-diameter steel pipe piles. These lines of piles will be placed approximately 50

feet apart along the alignment across the river channel within the right-of-way. It is anticipated that about five to eight piles will be required for each temporary support frame or bent structure. Both temporary and permanent supports will be placed using a vibratory hammer and will be designed to withstand winter flows. Both falsework construction and removal are anticipated to occur during the permitted in water work window, which extends from June 1 through October 15.

As previously described, in-stream work will require dewatering or diversion of water from the immediate work area, including the use of sheet pile cofferdams. When sheet piles are driven, potential impacts on fish in the immediate area will be minimized through implementation of the sound pressure measures and fish rescue plan identified in the BA. Once cofferdams are in place, pile construction will be accomplished using rotary drilling rigs, and using either bentonite or synthetic slurry along with temporary steel pipe casings to stabilize the upper portion of the pile shaft excavation. The estimated time to construct piles will vary with the diameter and depth of the drilled hole but is anticipated to require about 3 to 4 days per pile for installation of the larger diameter elements. Construction of all piles within the wetted perimeter of the low-flow channel, including cofferdam installation and removal, is anticipated to take approximately 4 to 6 weeks.

During construction, a qualified fisheries biologist with experience in snorkel survey and salmonid identification will conduct fish presence surveys just before any in-water work (e.g., installation of temporary sheet piles to isolate the work area) begins, and surveys will be conducted again if there is a multiday pause or lapse in construction activities. Once construction of all crossing-related facilities is complete, the channel and banks will be returned to pre-construction contours, temporary Best Management Practices (BMPs) removed, and the banks revegetated per the Mitigation Monitoring and Reporting Plan.

6.1.1 Kings River Crossings

The proposed Kings River Crossings consist of three separate water crossings, which are needed because the Kings River is in three separate branches at the points of the crossings (Dutch John Cut, Cole Slough and Kings River). The crossings would be accomplished by constructing an elevated truss that would use the minimum number of support structures to safely span the river complex. The track would be elevated approximately 800 feet north of the north bank of Cole Slough to provide ample clearance for flood flows and wildlife. The elevated structure will span all three portions of the Kings River complex. The elevated structure will have a minimum elevation of 18 feet above the Kings River complex. A single pile is anticipated to be placed in the center of Kings River (See Figure 2-19).

6.1.2 Cross Creek Crossing

The proposed approach for the Cross Creek Crossing will be similar to that proposed for the Kings River Crossings. The elevated approach begins approximately 4,000 feet north of the north bank of Cross Creek, and it has a minimum vertical clearance of less than 30 feet. See Figure 2-20 for a detailed drawing of the crossing. A single pile is anticipated to be placed in the center of Cross Creek.

6.1.3 Tule River Crossing

The proposed approach for the Tule River Crossing will be similar to that proposed for the Kings River Crossings. The elevated approach begins approximately 8,000 feet north of the Tule River and has a minimum vertical clearance over the river of less than 30 feet. See Figure 2-21 for a detailed drawing of the crossing. A single pile is anticipated to be placed in the Tule River towards the south bank.

6.1.4 Deer Creek Crossing

The proposed approach for the Deer Creek Crossing will be similar to that proposed for the Kings River Crossings. The elevated approach begins approximately 200 feet north of the creek and has a minimum vertical clearance over the river of approximately 6 feet. See Figure 2-21 for a detailed drawing of the crossing. A single pile is anticipated to be placed with Deer Creek near the north bank.

6.1.5 Poso Creek Crossing

The proposed approach for the Poso Creek Crossing will be similar to that proposed for the Kings River Crossings. The elevated approach begins approximately 40 feet from the north bank of Poso Creek and has a minimum vertical clearance over the creek of approximately 10 feet. See Figure 2-23 for a detailed drawing of the crossing. A single pile is anticipated to be placed in the middle of the creek.

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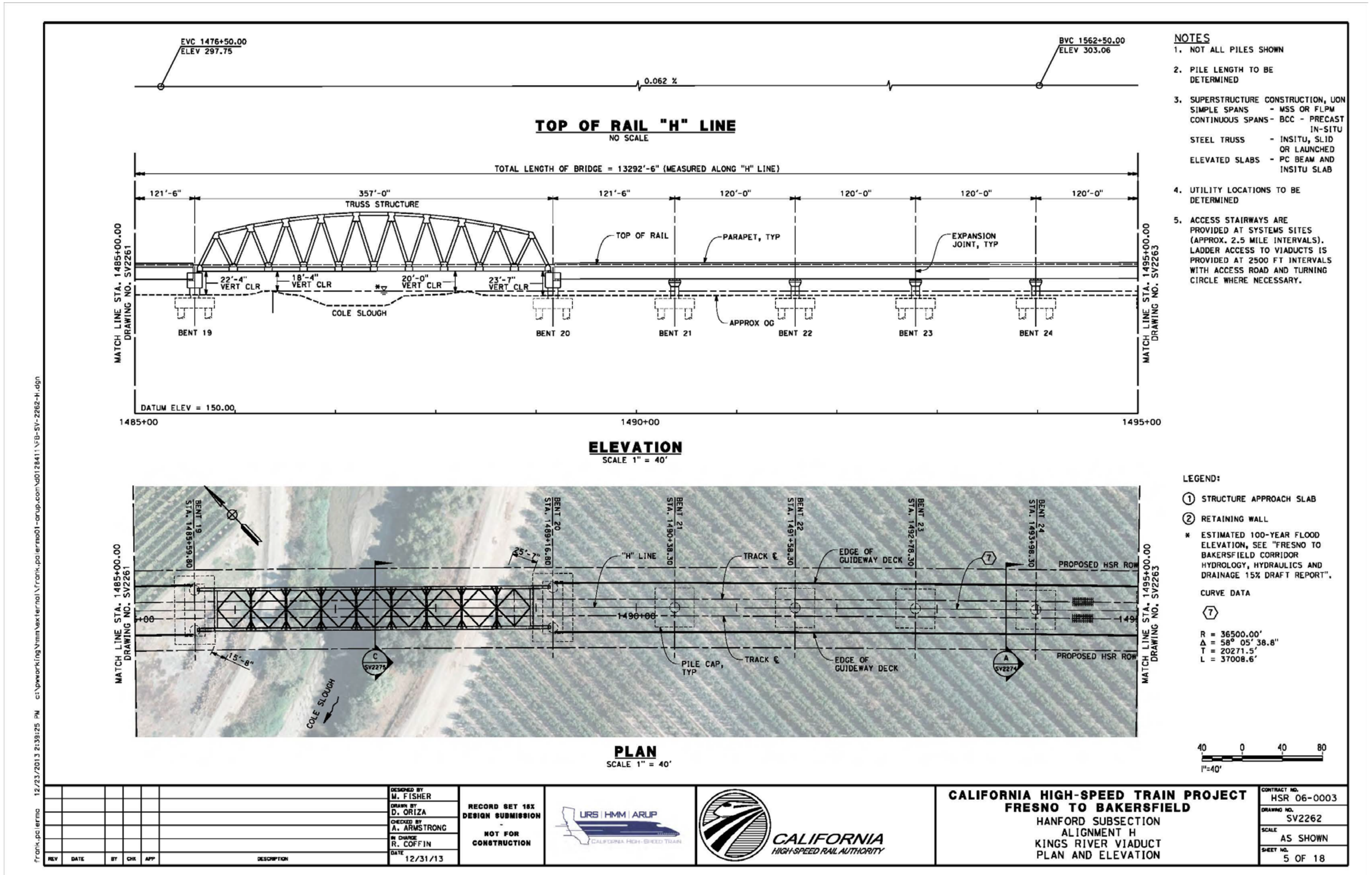

Figure 2-19
Kings River Crossing Engineering Design (Sheet 1 of 4)

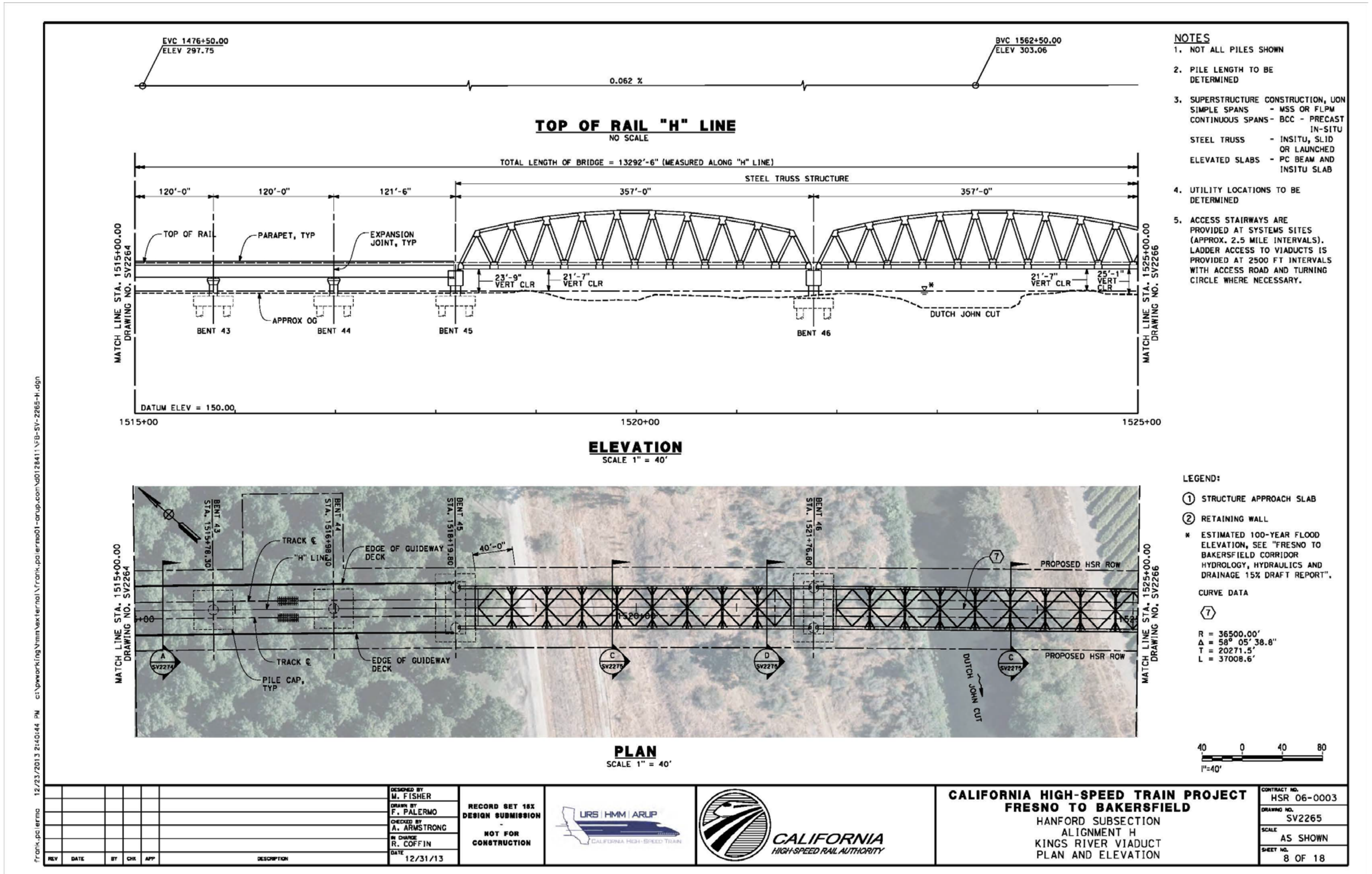

Figure 2-19
Kings River Crossing Engineering Design (Sheet 2)

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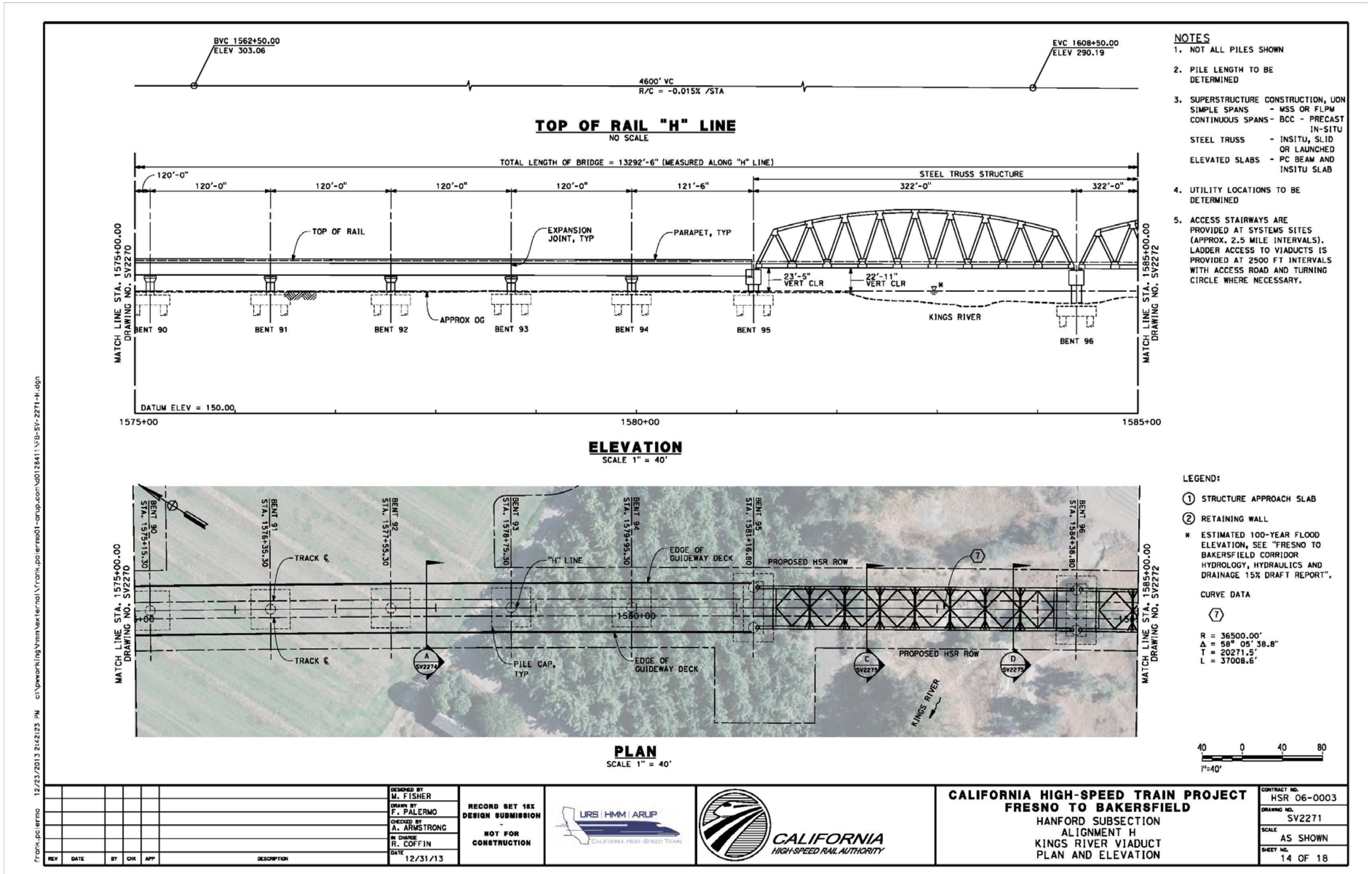

Figure 2-19
Kings River Crossing Engineering Design (Sheet 3)

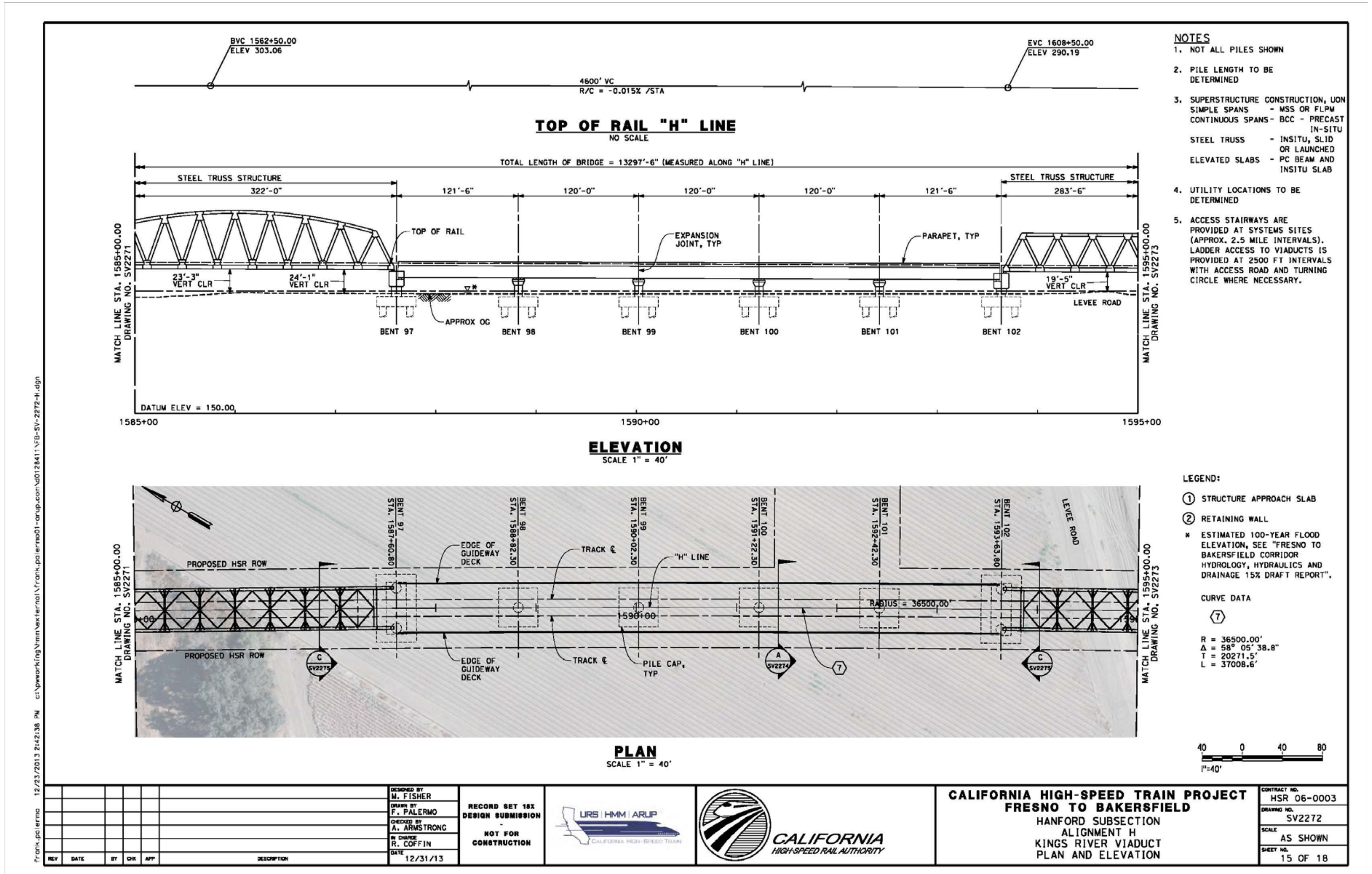

Figure 2-19
Kings River Crossing Engineering Design (Sheet 4)

RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

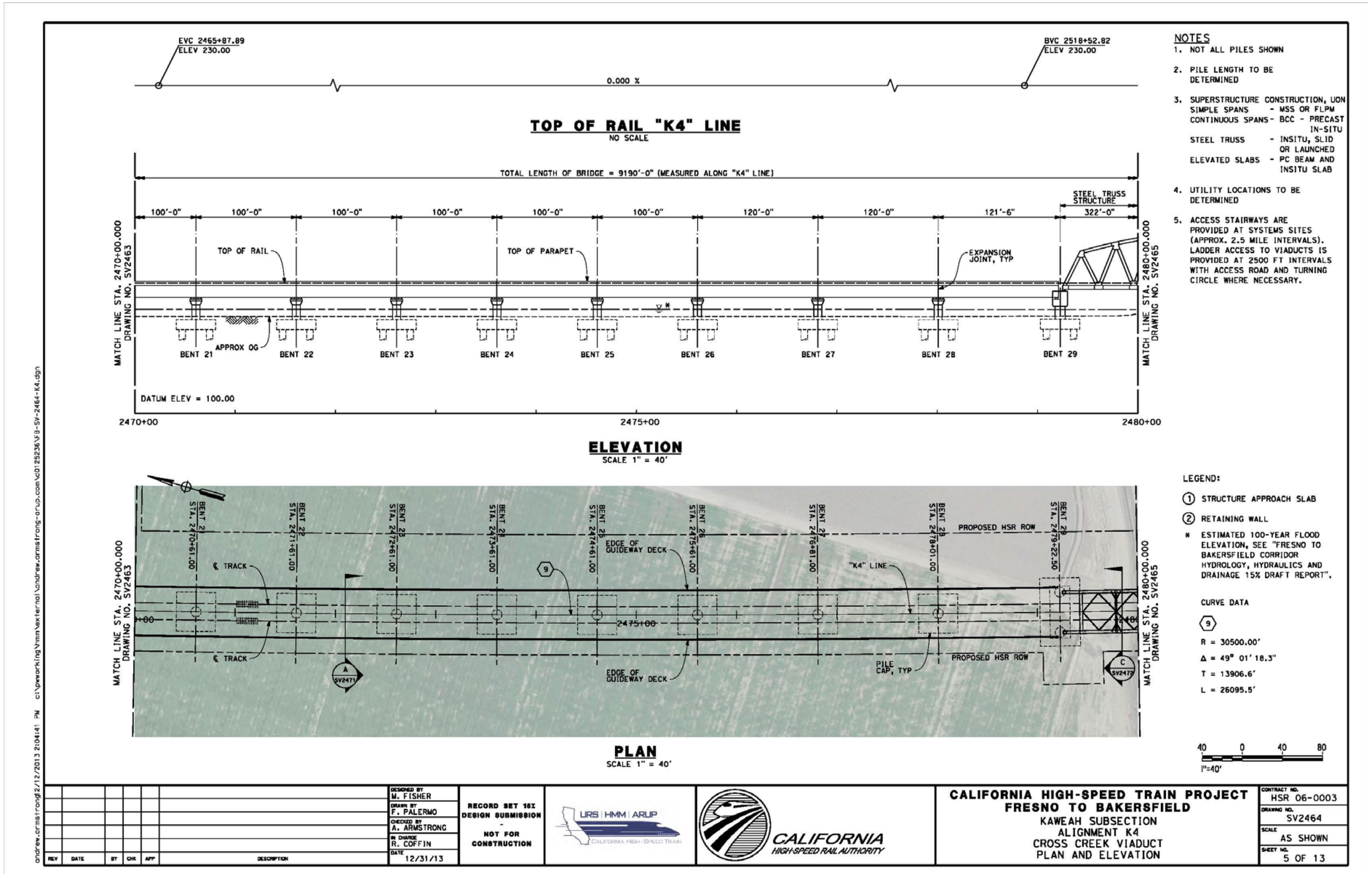

Figure 2-20
Cross Creek Crossing Engineering Design

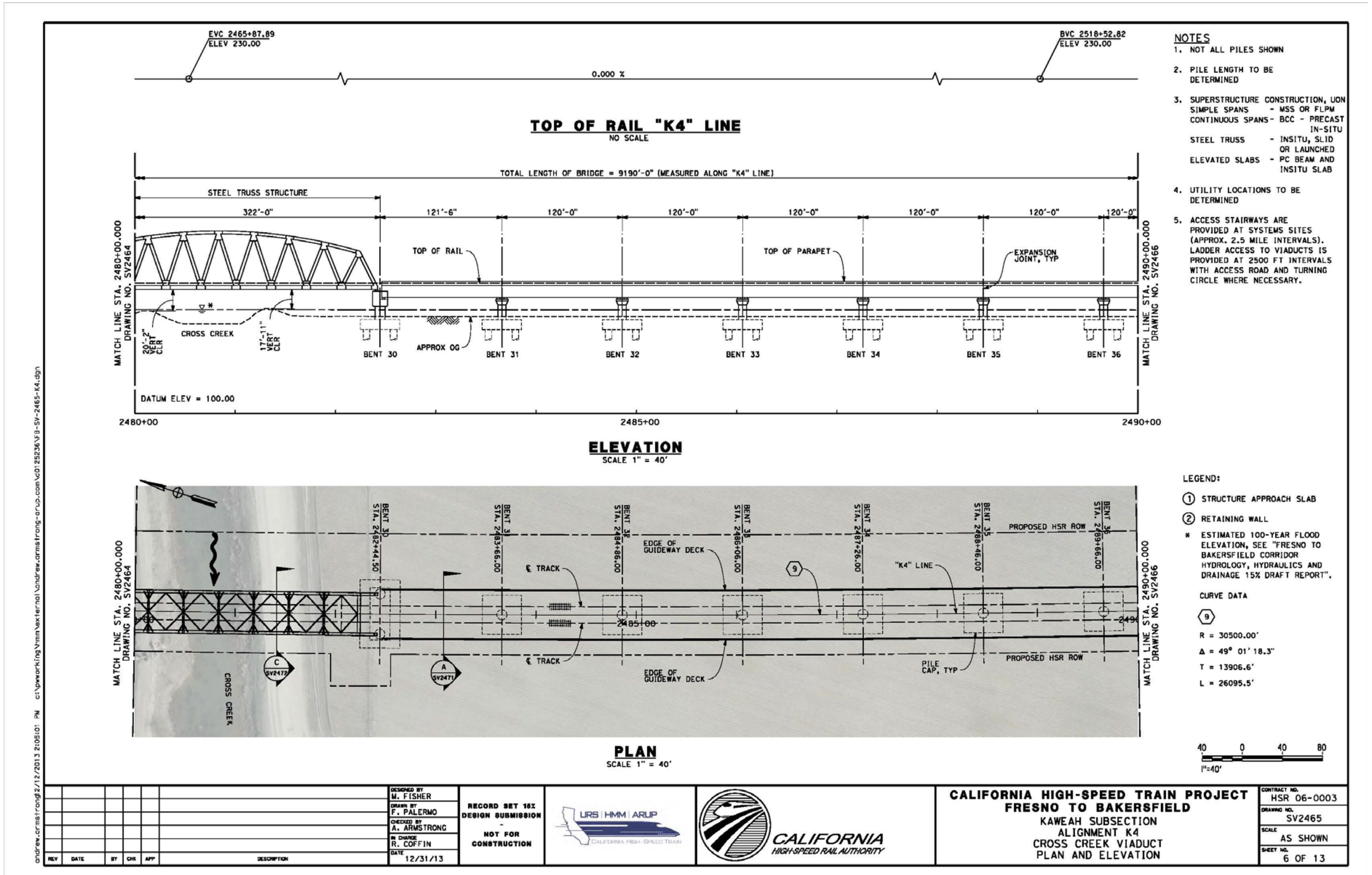

Figure 2-21
Tule River Crossing Engineering Design (Sheet 1 of 2)

RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

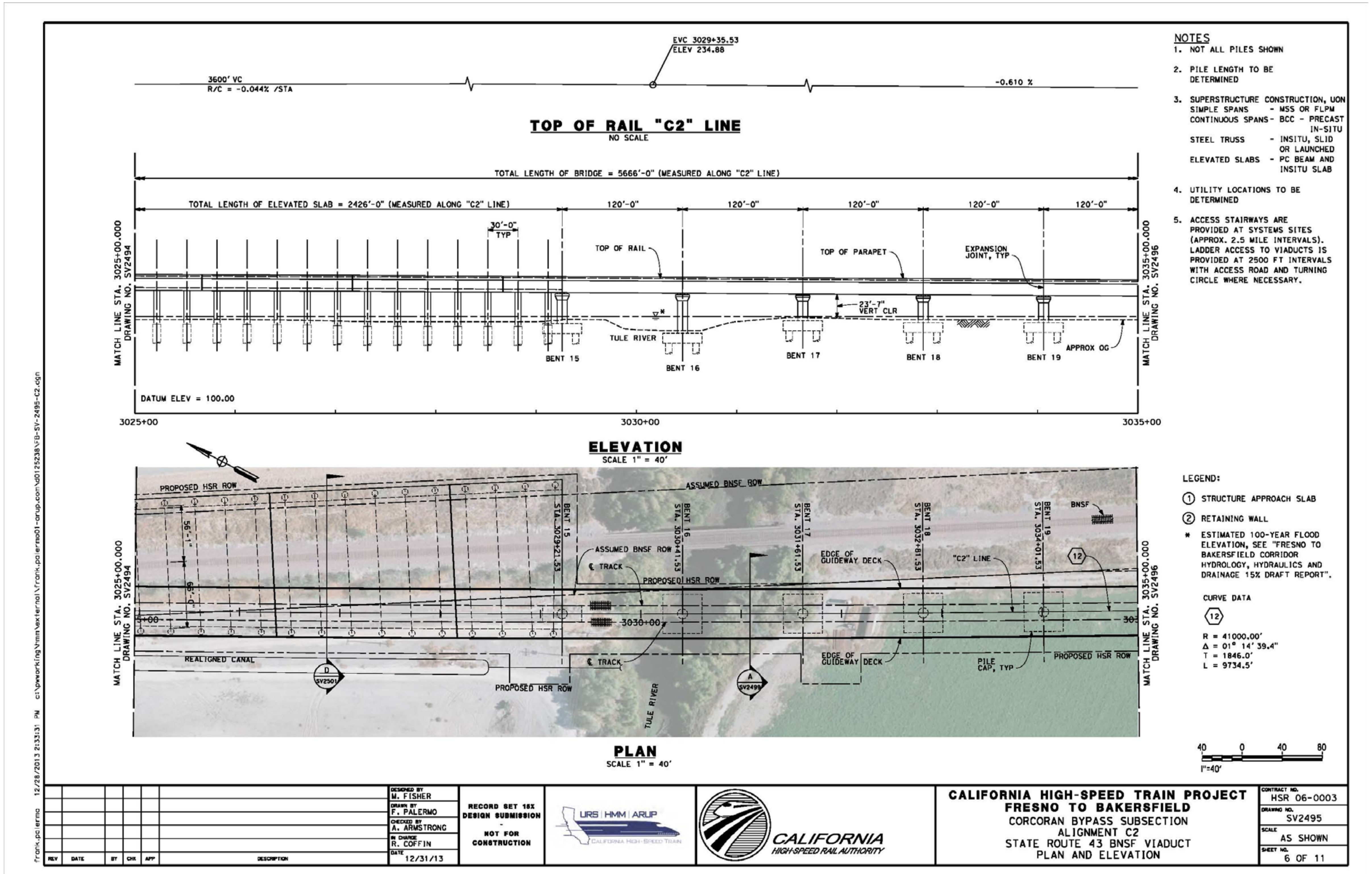

Figure 2-21
Tule River Crossing Engineering Design (Sheet 2 of 2)

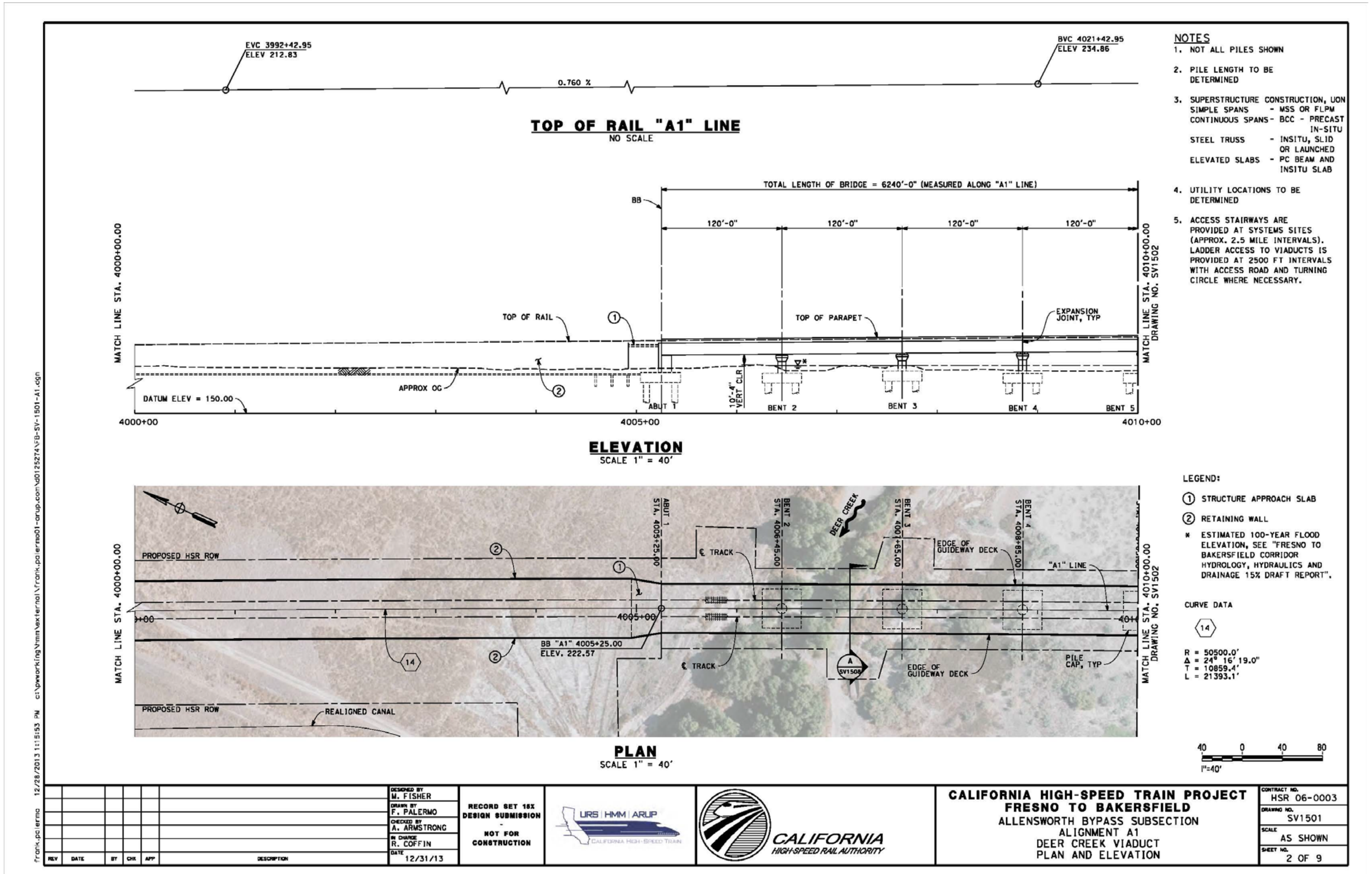

Figure 2-22
Deer Creek Crossing Engineering Design

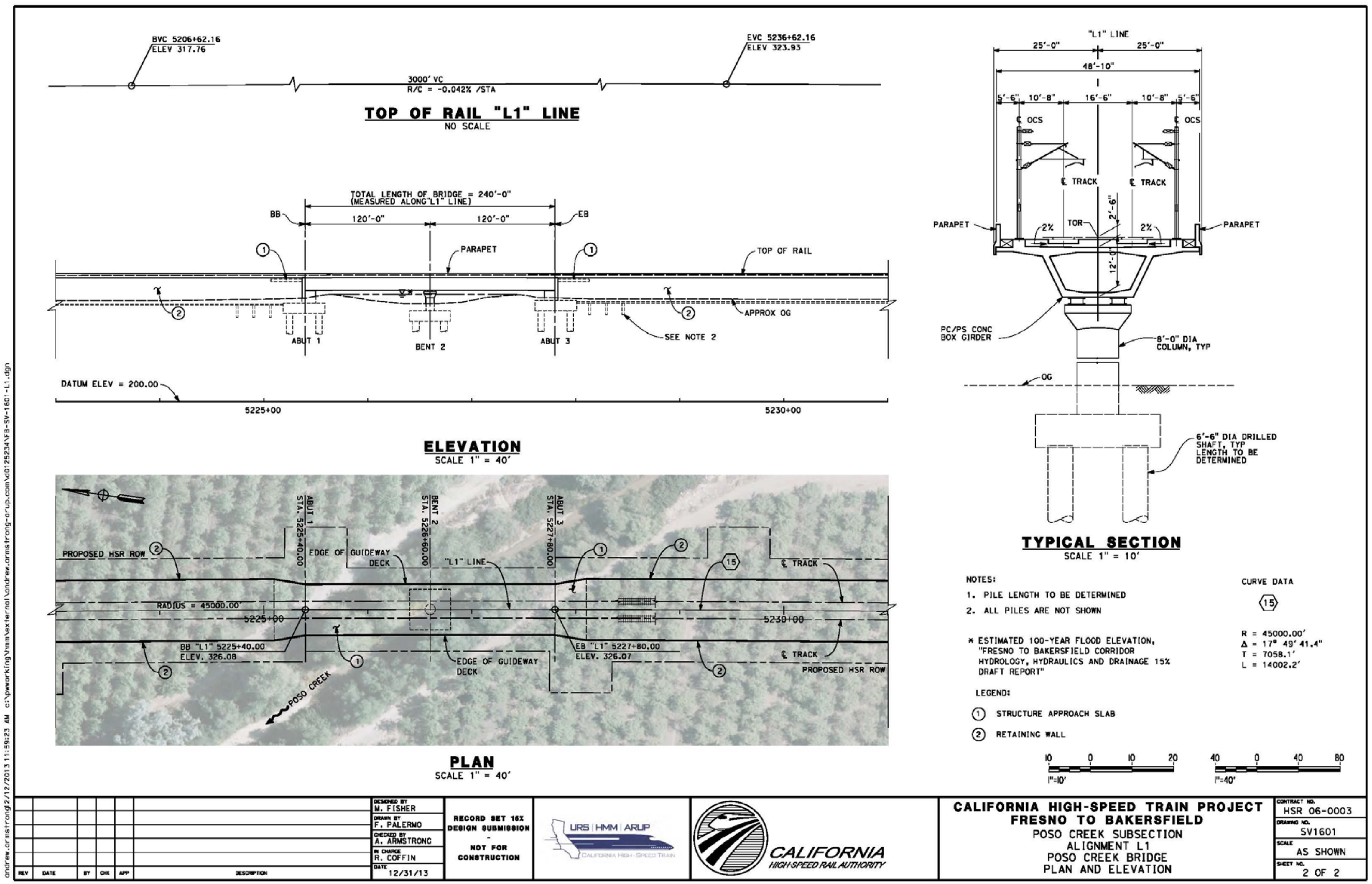

Figure 2-23
Poso Creek Crossing Engineering Design

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6.2 Other Constructed Watercourse

A total of 120 additional canals and ditches will be crossed using precast concrete box culverts, with the number of cells or openings being dependent on the hydrology. Some culverts may be cast in place as determined appropriate by the construction contractor. Culverts will be sized to pass maximum canal/drain flows at all crossing locations.

6.3 Depressional Aquatic Features

Depressional features (vernal pools, seasonal wetlands, and open water pools; 50 total features) will be permanently impacted, with fill placed across the features as necessary to support the HST guideway, other than in areas associated with elevated track (e.g., approach to crossing of highway or major stream feature). Fill across depressional features will be limited to that portion required to support the trackway and culverts installed, where necessary.

6.4 Constructed Basins

The approach for crossings of constructed basins (47 total features) will be similar in nature to the approach used to cross depressional aquatic features. Fill will be placed in basins as necessary to support the guideway and will be limited to the amount required. Culverts will be installed where necessary. Depending on the extent of the impact, basins would be modified, improved, or replaced as needed onsite to maintain existing drainage and hydrologic functions, and to support HST drainage requirements.

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Appendix 3:

USACE Preliminary Jurisdictional Determination and Verification Letter

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

February 5, 2013

Regulatory Division (SPK-2009-01482)

Mr. Lupe Jimenez
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, California 95814-3359

Dear Mr. Jimenez:

We are responding to your January 18, 2013, request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Fresno to Bakersfield Section of the California High-Speed Rail project site. The approximately 26, 955-acre review area starts within the City of Fresno, at Latitude 36.73947°, Longitude -119.80214°, and continues southeast along multiple corridor options, terminating in the City of Bakersfield, at Latitude 35.36655°, Longitude -118.94925°, within Fresno, Kings, Tulare, and Kern Counties, California.

Based on available information, **we concur with the amount and location of wetlands and other water bodies within the review area as depicted on the January, 2013, *California High-Speed Train Project EIR/EIS Fresno to Bakersfield Section, Appendix B: Jurisdictional Waters Delineation Results,* prepared by URS**. The approximately 148.240 acres of wetlands and 537.364 acres of other water bodies present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act.

A copy of our RGL 08-02 Preliminary Jurisdictional Determination Form for this site is enclosed. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the

particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2009-01482 in any correspondence concerning this project. If you have any questions, please contact Zachary Simmons in our California South Regulatory Branch, email *Zachary.M.Simmons@usace.army.mil*, or telephone 916.557.6746. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Paul Maniccia

Paul Maniccia
Chief, California South Branch

Enclosures

Copy Furnished with enclosures

Mr. Jason Brush, Chief, U.S. Environmental Protection Agency, Region IX, Wetlands Regulatory Office (WTR-8), 75 Hawthorne Street, San Francisco, California 94105-3901

Copy Furnished without enclosures

Ms. Melissa DuMond, Federal Railroad Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590-0001
Mr. Thomas Leeman, San Joaquin Valley Branch, Endangered Species Division, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1888
Mr. Matthew Scroggins, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality Control Board, 1685 E Street, Fresno, California 93706-2020
Ms. Maria Rea, National Marine Fisheries Service, 650 Capitol Mall, Suite 5-100, Sacramento, California 95814-4706

PRELIMINARY JURISDICTIONAL DETERMINATION FORM
Sacramento District

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Regulatory Branch: **California South** File/ORM #: **SPK-2009-01482** PJD Date: **February 5, 2013**

State: **CA** City/County: **Fresno, Kings, Tulare, and Kern** Nearest Waterbody: Location (Lat/Long): **from 36.73947, -119.80214 to 35.36655, -118.94925** Size of Review Area: **26,955** acres	Name/Address Of Property Owner/ Potential Applicant: **Lupe Jimenez** **California High Speed Rail Authority** **770 L Street, Suite 800** **Sacramento, California 95814-3359**
Identify (Estimate) Amount of Waters in the Review Area **Non-Wetland Waters:** linear feet ft wide **537.364** acre(s) Stream Flow: **N/A** **Wetlands: 148.240** acre(s) Cowardin Class: **Palustrine, emergent**	Name of any Water Bodies on the site identified as Section 10 Waters: Tidal: Non-Tidal: ☐ Office (Desk) Determination ☒ Field Determination: Date(s) of Site Visit(s): **4/18/11 - 4/21/11**

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **California High-Speed Train Project EIR/EIS Fresno to Bakersfield Section, Appendix B: Jurisdictional Waters Delineation Results, Dated January 2013, prepared by URS**
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- ☐ Data sheets prepared by the Corps.
- ☐ Corps navigable waters' study.
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name:
- ☐ USDA Natural Resources Conservation Service Soil Survey.
- ☒ National wetlands inventory map(s).
- ☐ State/Local wetland inventory map(s).
- ☐ FEMA/FIRM maps.
- ☐ 100-year Floodplain Elevation (if known):
- ☒ Photographs: ☒ Aerial
  ☒ Other
- ☐ Previous determination(s). File no. and date of response letter:
- ☒ Other information (please specify): **Data is composed of results from field work, agency site visits, remote sensing data provided by the consultant, and publically available satellite imagery viewed on Google Maps and Bing Maps.**

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

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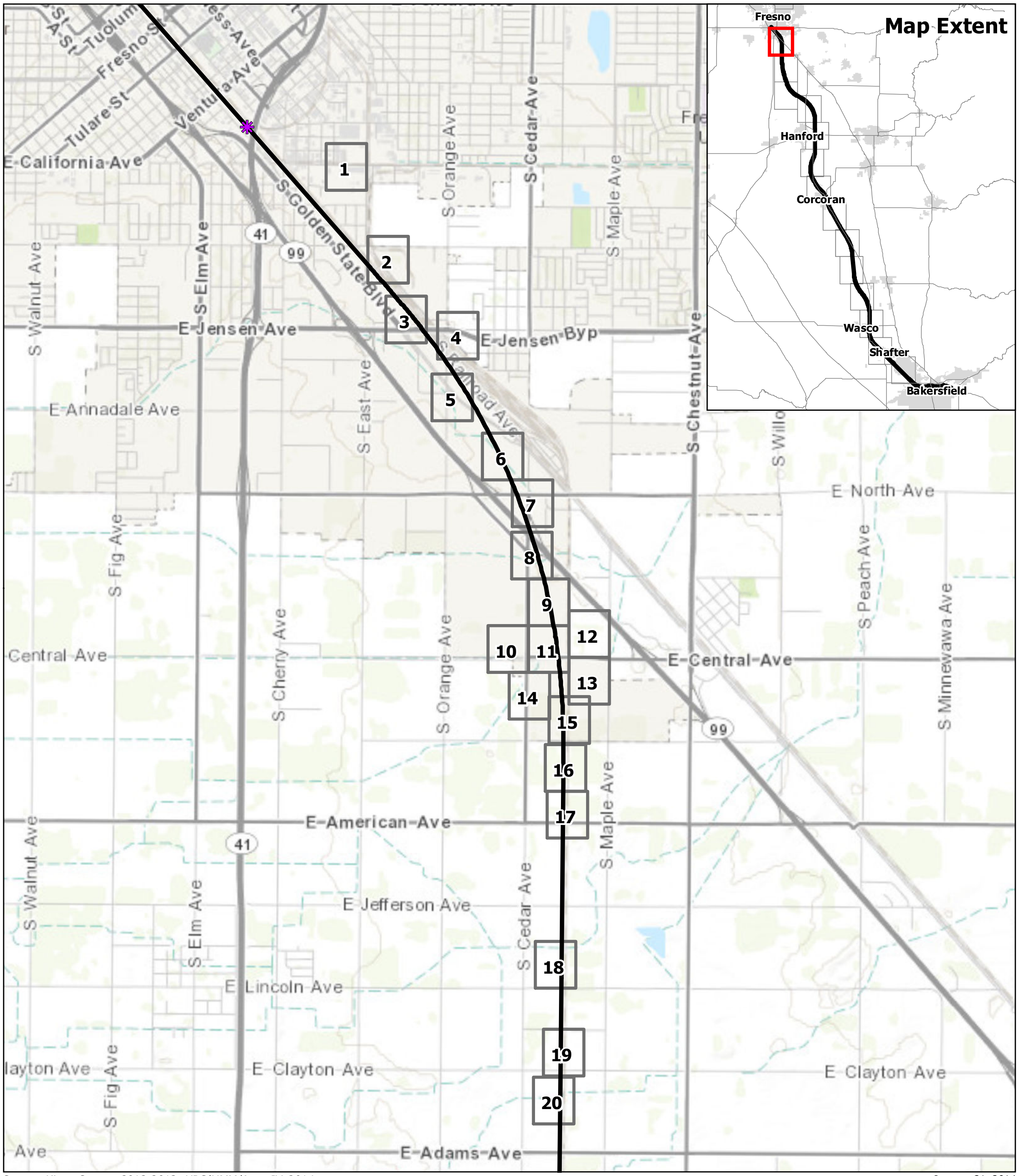
Appendix 4:
Project Impact Mapbook



Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014

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Miles

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Kilometers

PP1 terminus
Preferred Alternative
Mapbook Pages

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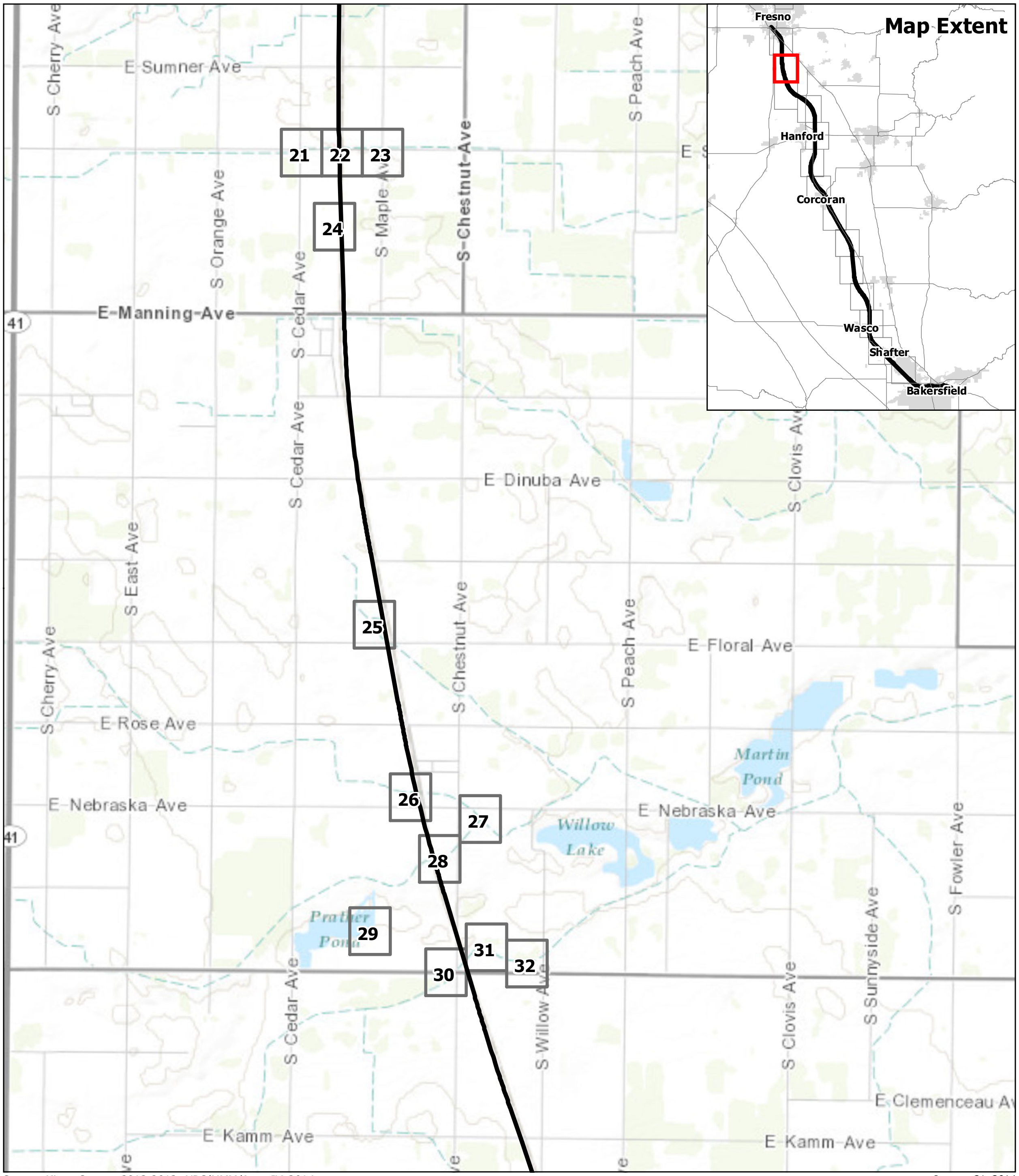
CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration



Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014

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PP1 terminus
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Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014

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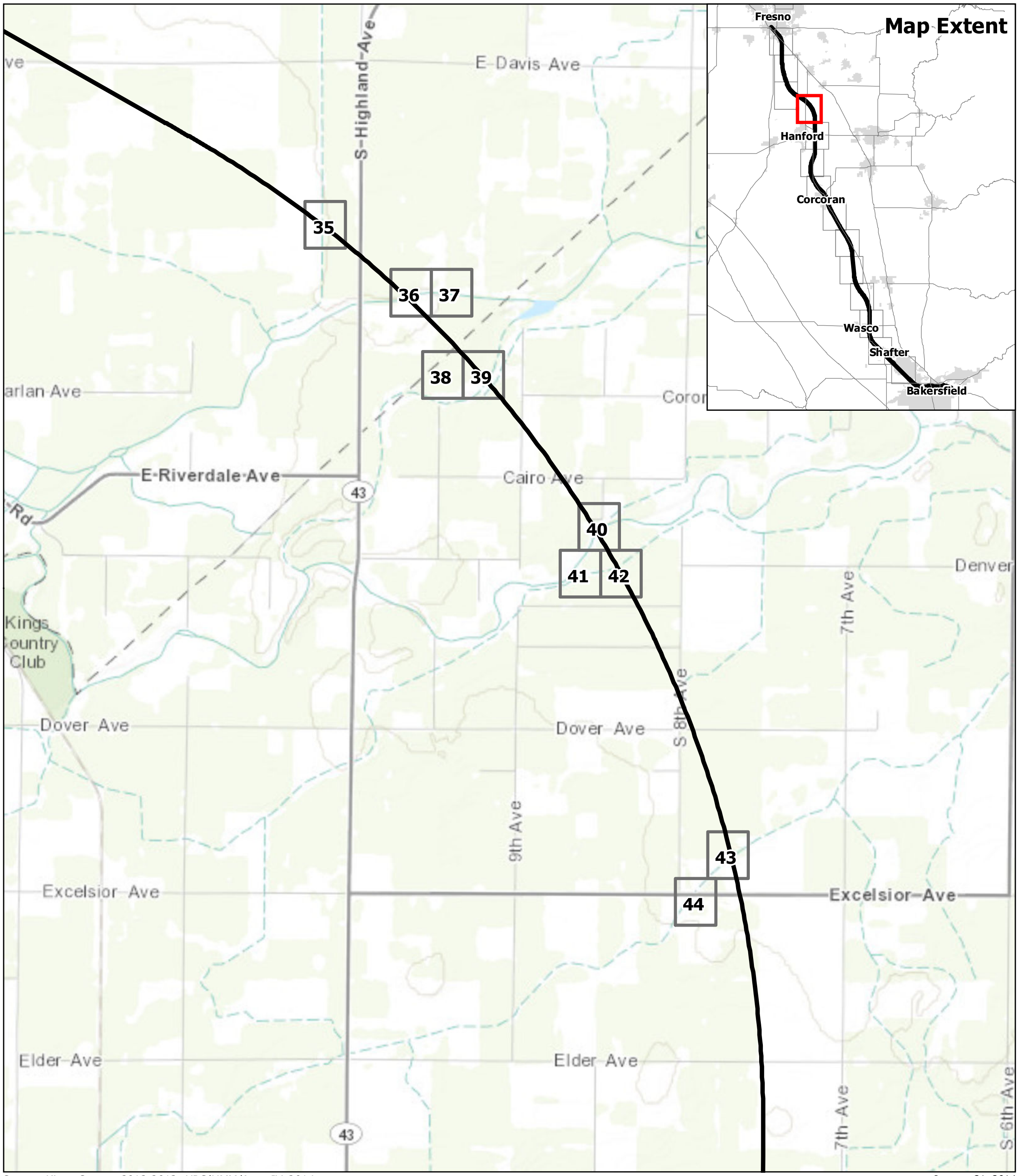

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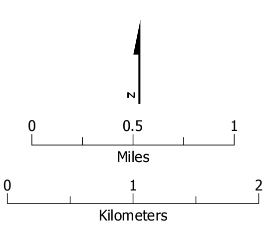
January 21, 2014



PP1 terminus
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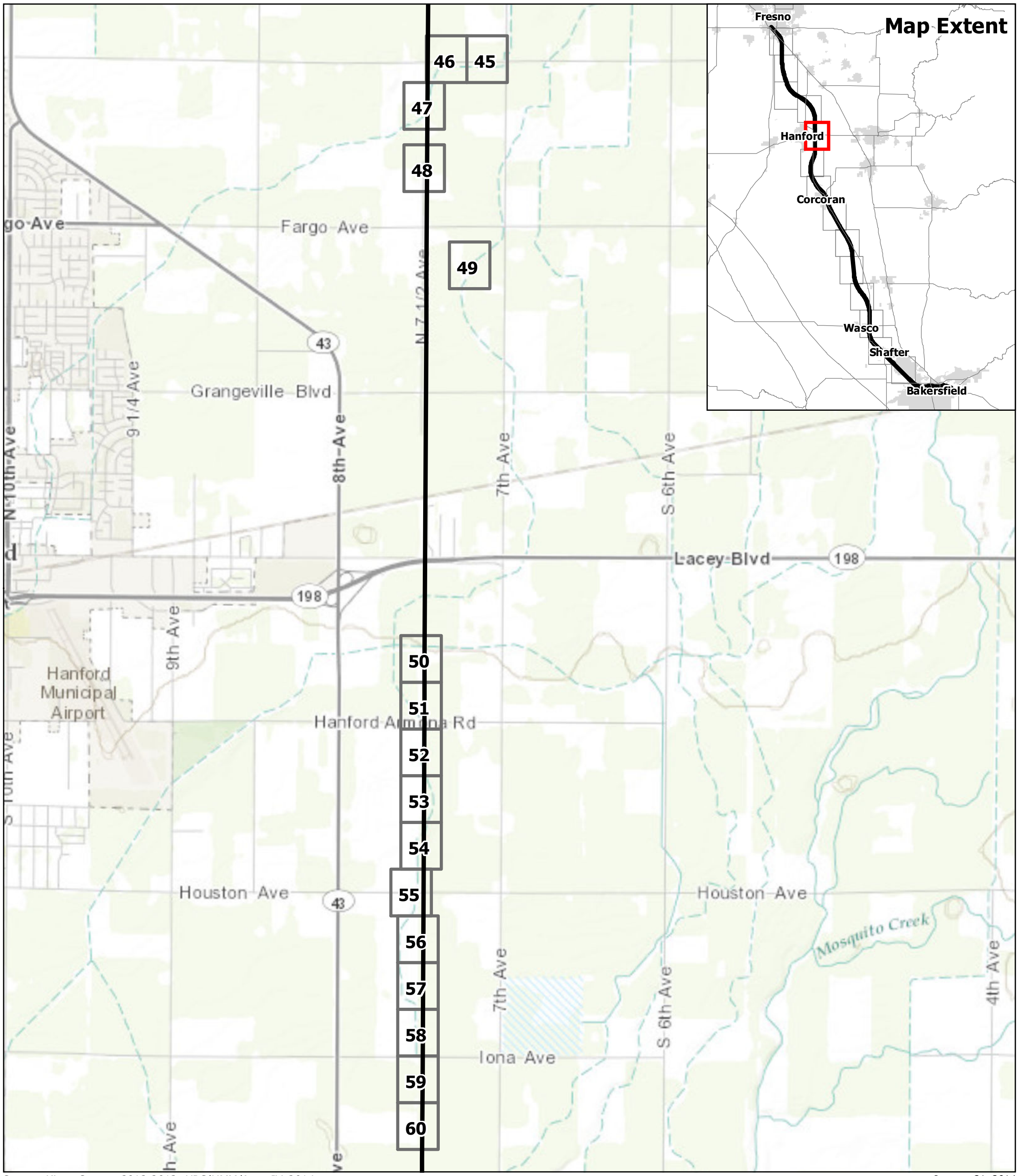
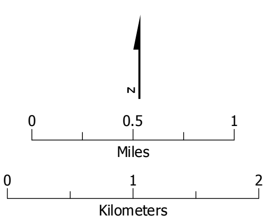
U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA High-Speed Rail Authority



Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014



PP1 terminus
Preferred Alternative
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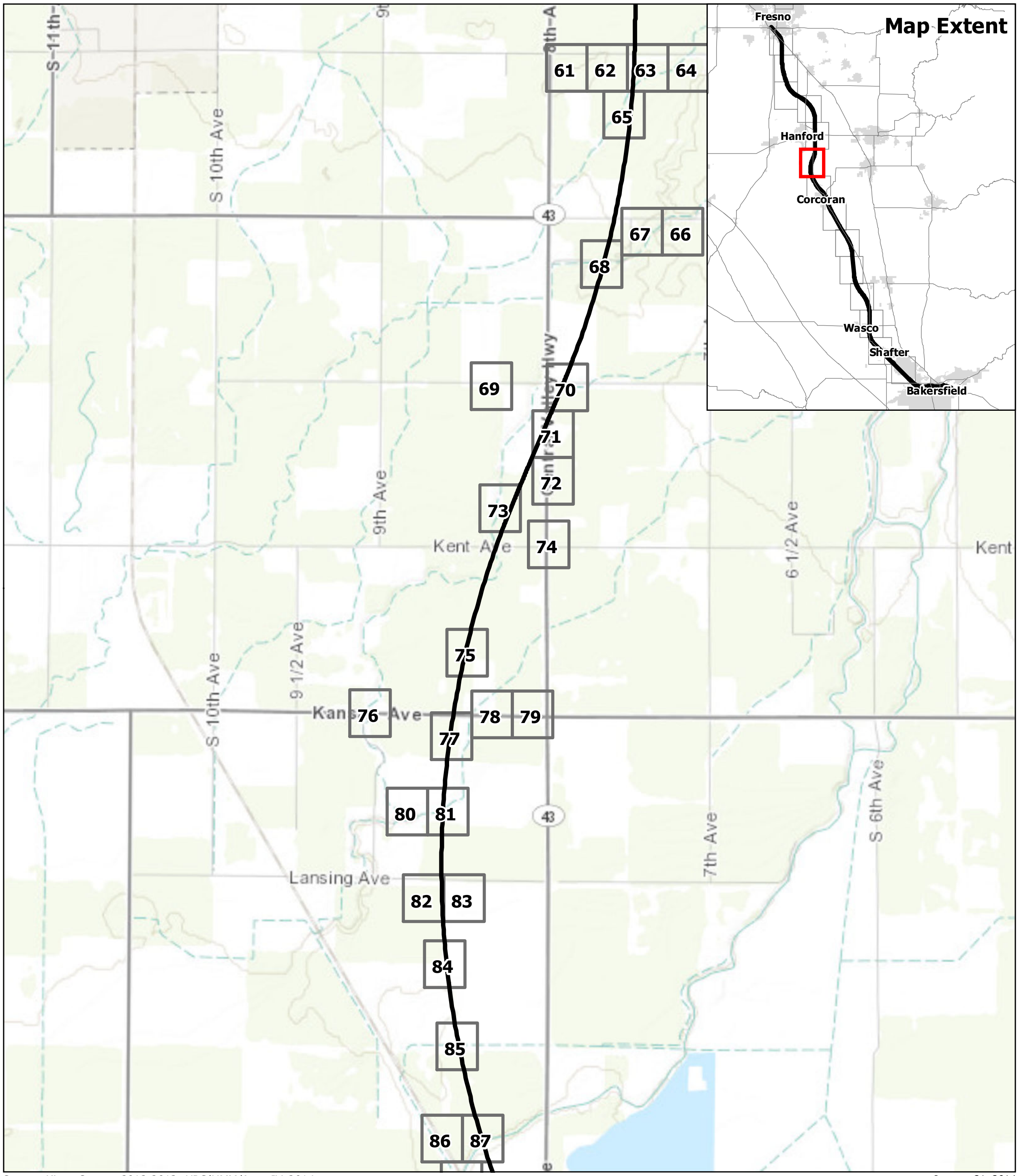

Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014

0 0.5 1
Miles
0 1 2
Kilometers

PP1 terminus
Preferred Alternative
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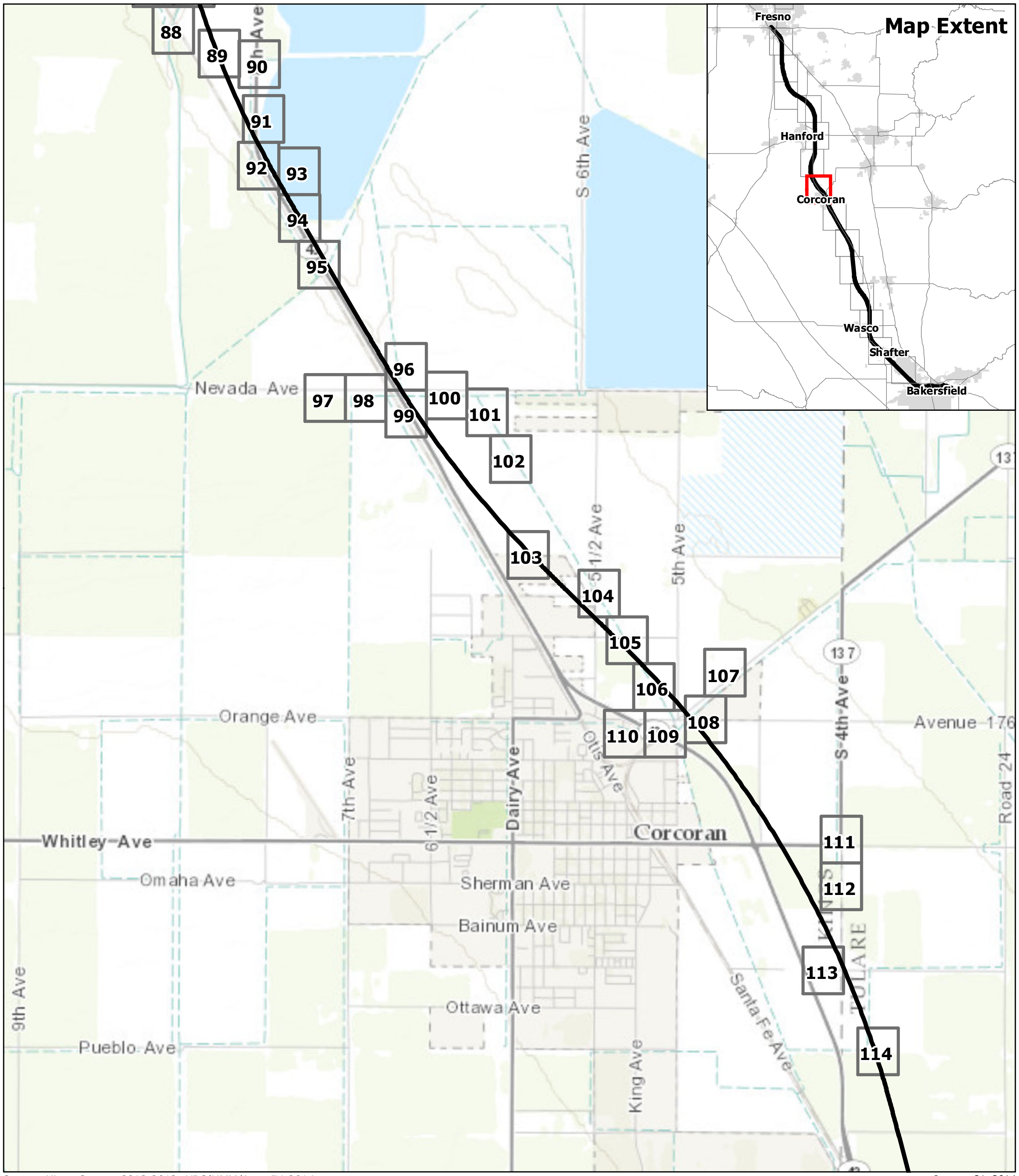

Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

January 21, 2014

N

0 0.5 1
Miles

0 1 2
Kilometers

PP1 terminus
Preferred Alternative
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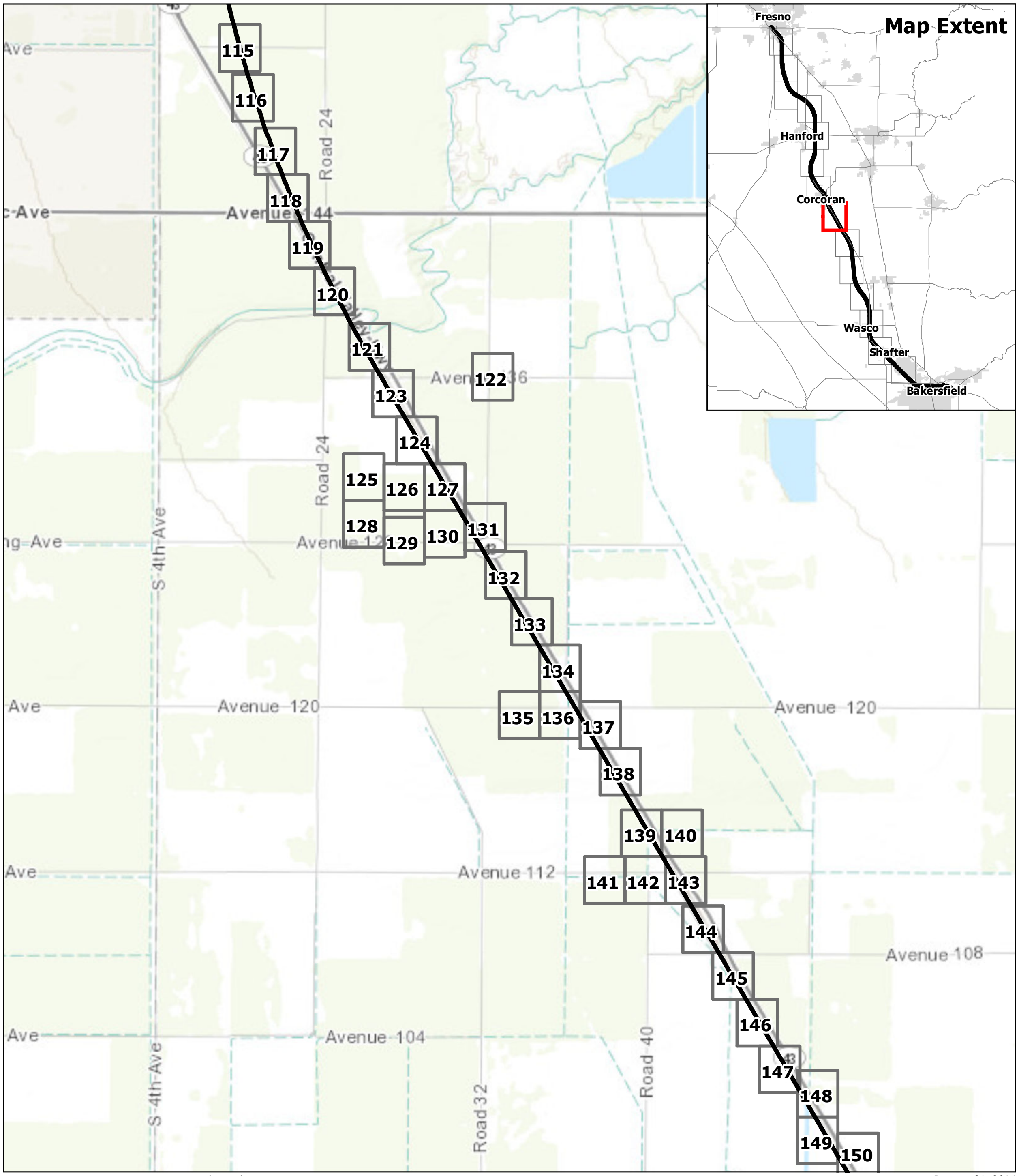

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Image source: ESRI

January 21, 2014

0 0.5 1
Miles
0 1 2
Kilometers

PP1 terminus
Preferred Alternative
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

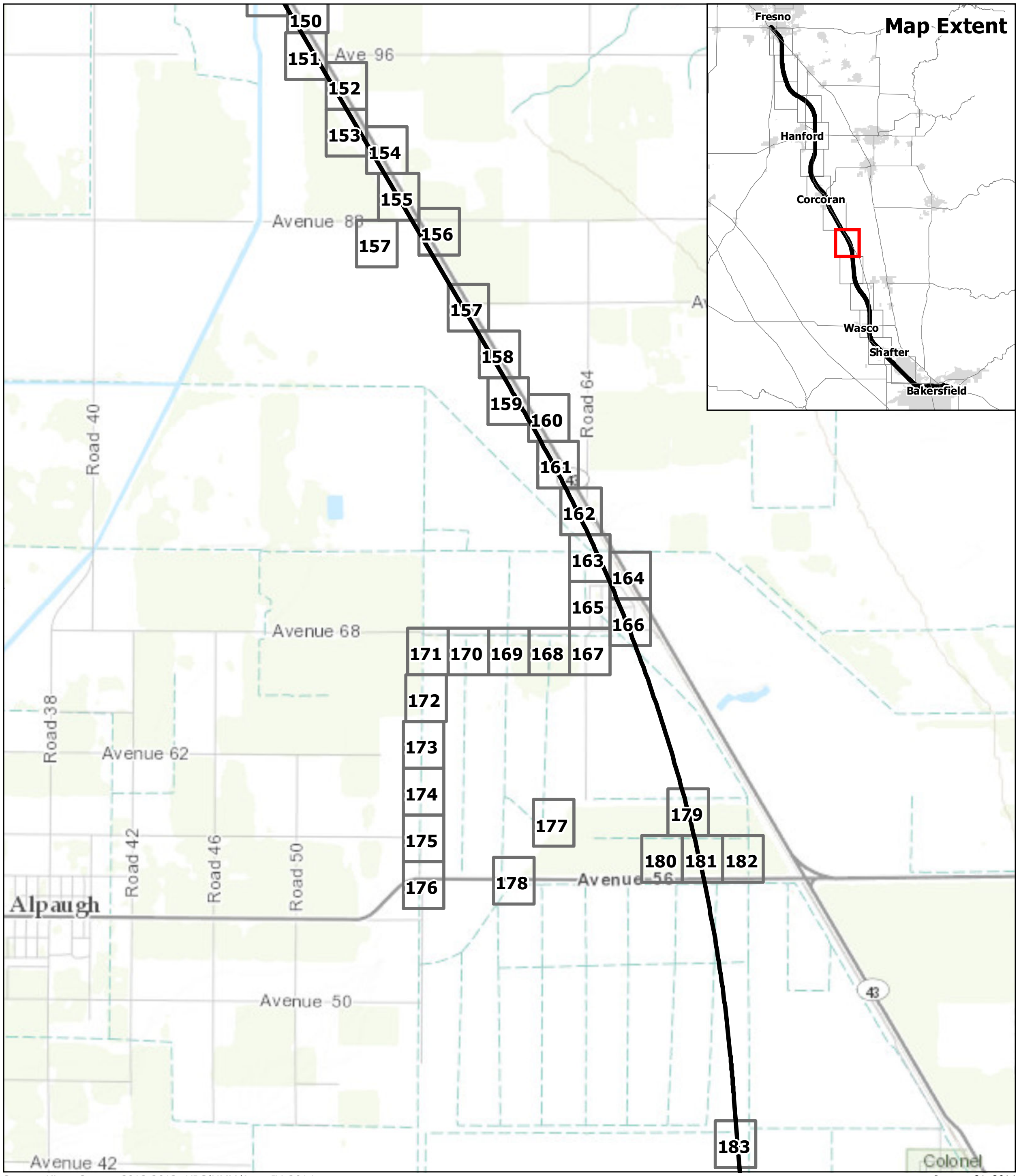

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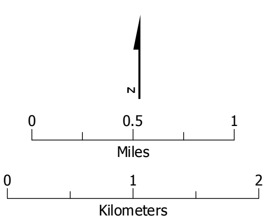
Image source: ESRI

January 21, 2014



PP1 terminus
Preferred Alternative
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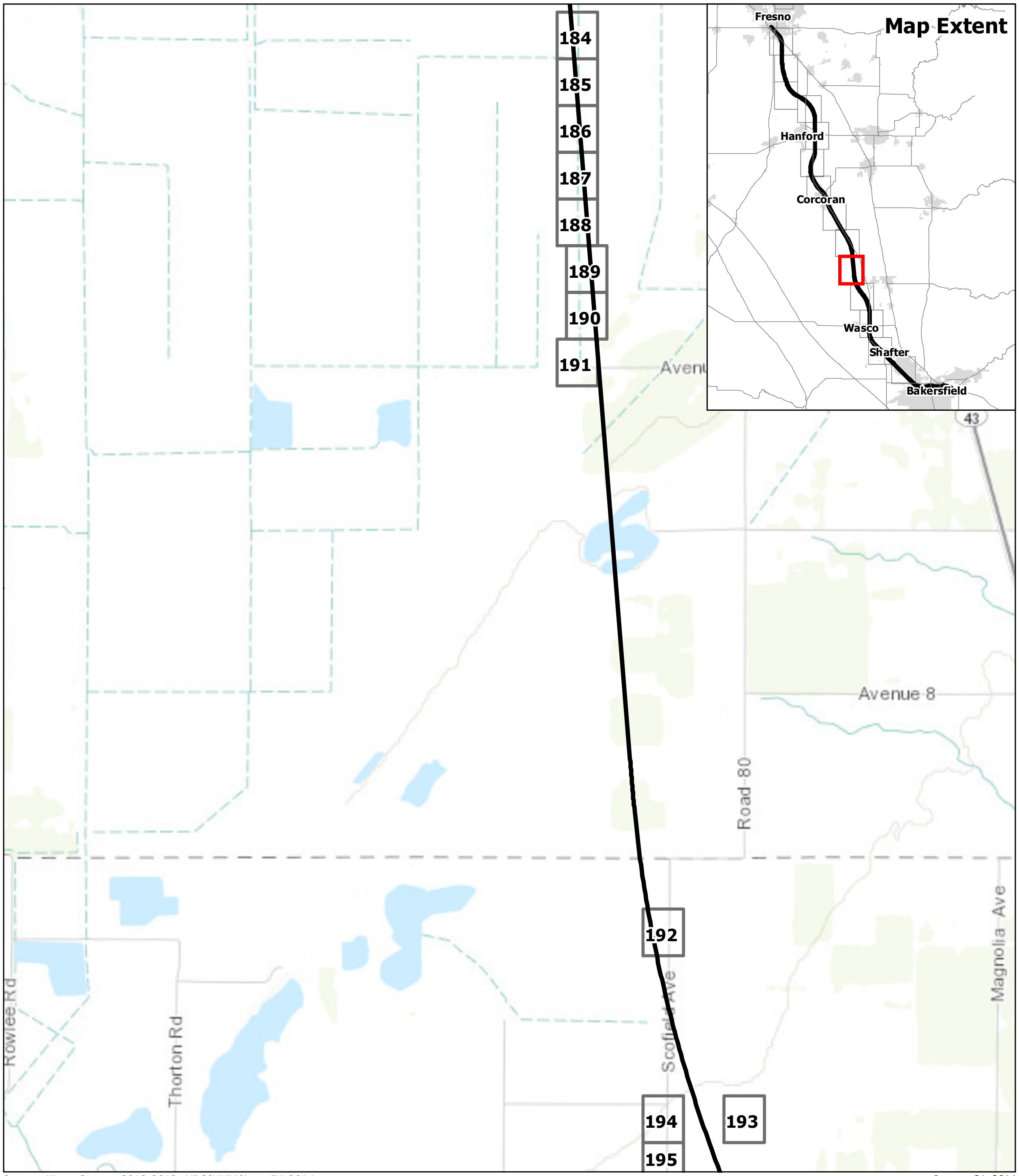

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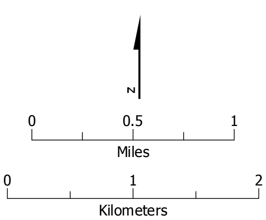
Image source: ESRI

January 21, 2014



- PP1 terminus
- Preferred Alternative
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: Kings County, 2012-2013; URS/HMM/Arup JV, 2014.
Image source: ESRI

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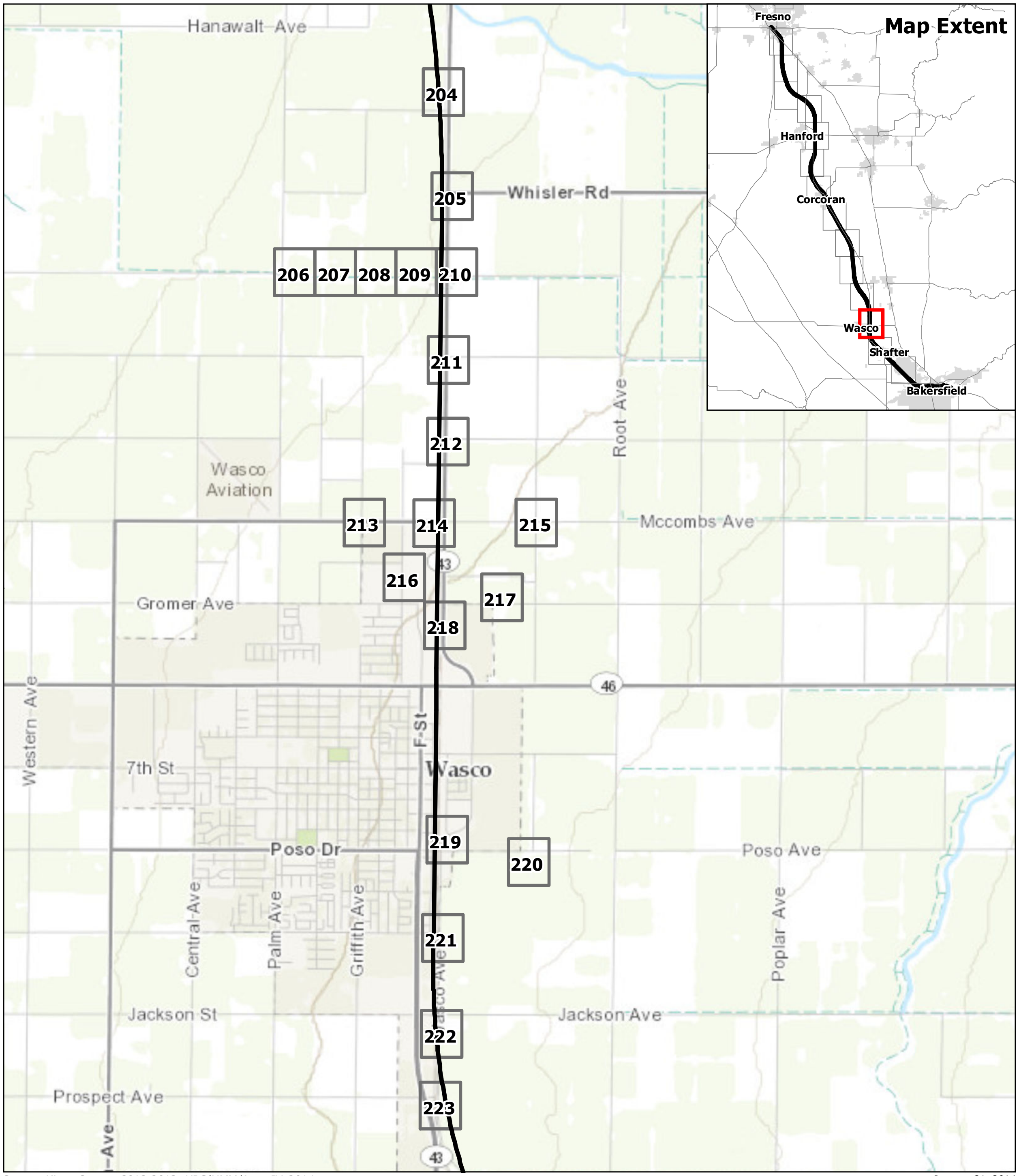

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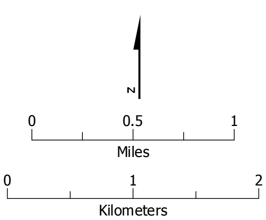
Image source: ESRI

January 21, 2014



PP1 terminus
Preferred Alternative
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

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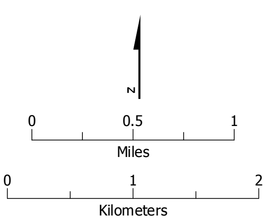
Image source: ESRI

January 21, 2014



PP1 terminus
Preferred Alternative
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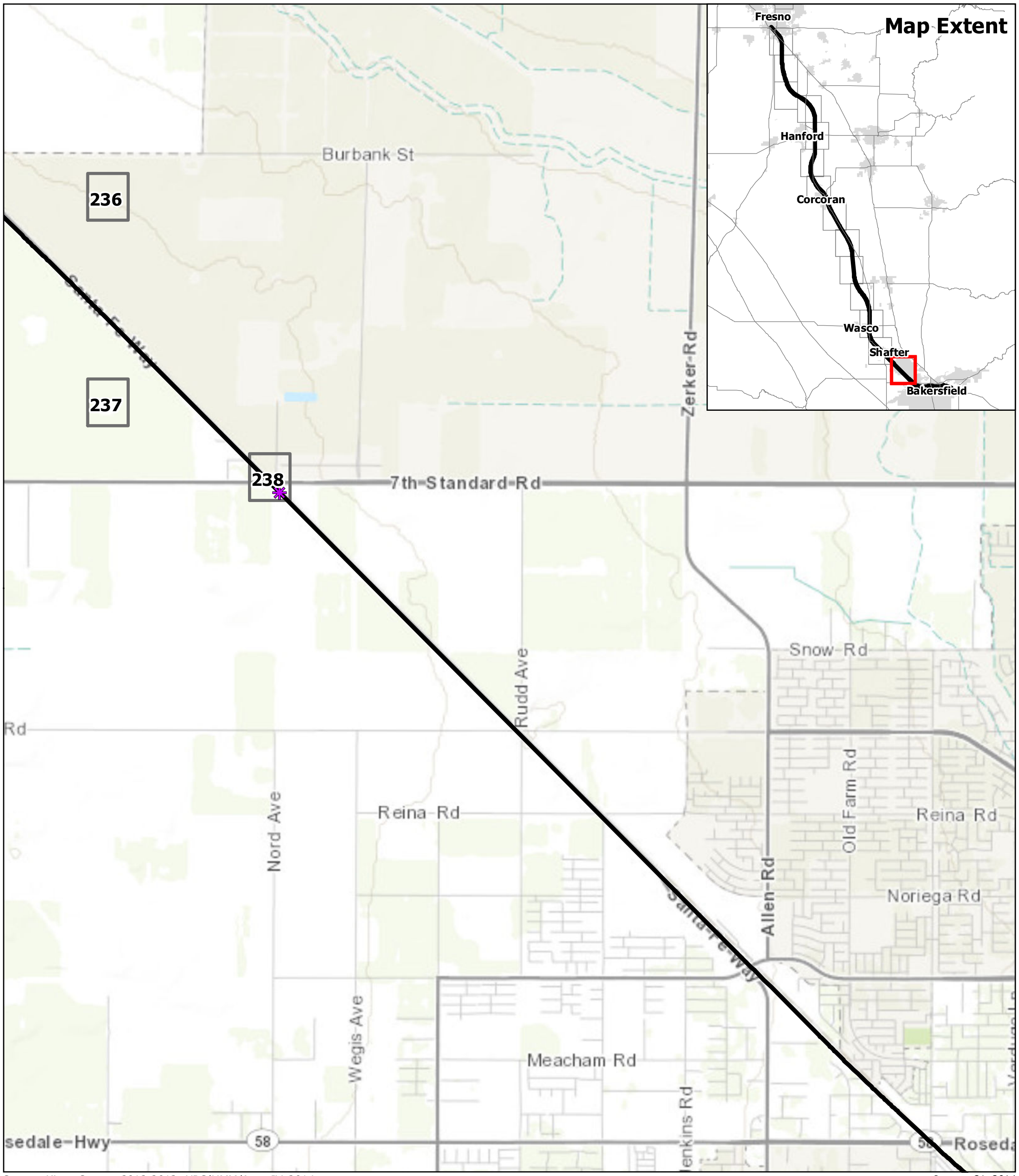

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Image source: ESRI

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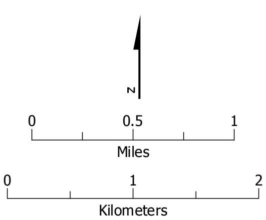

PP1 terminus
Preferred Alternative
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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

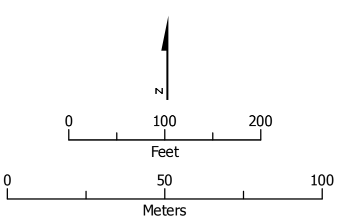
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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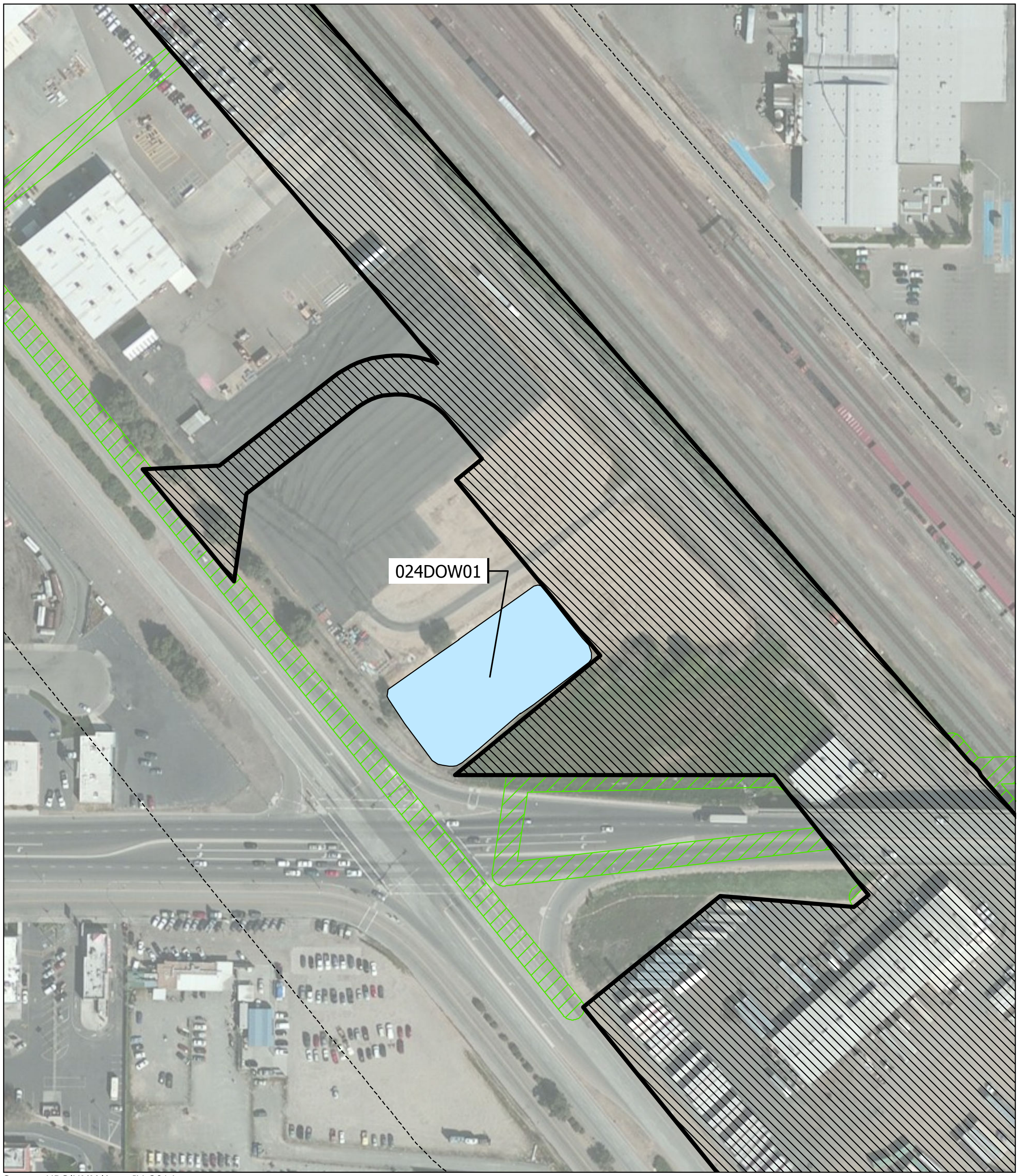

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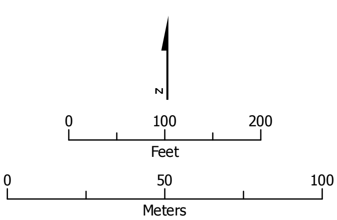
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

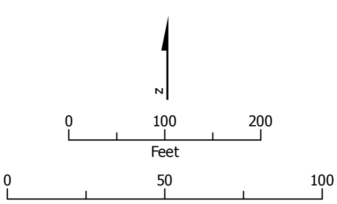
0 50 100
Meters

Appendix 4
Project Impact Mapbook
Page 4 of 246

RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

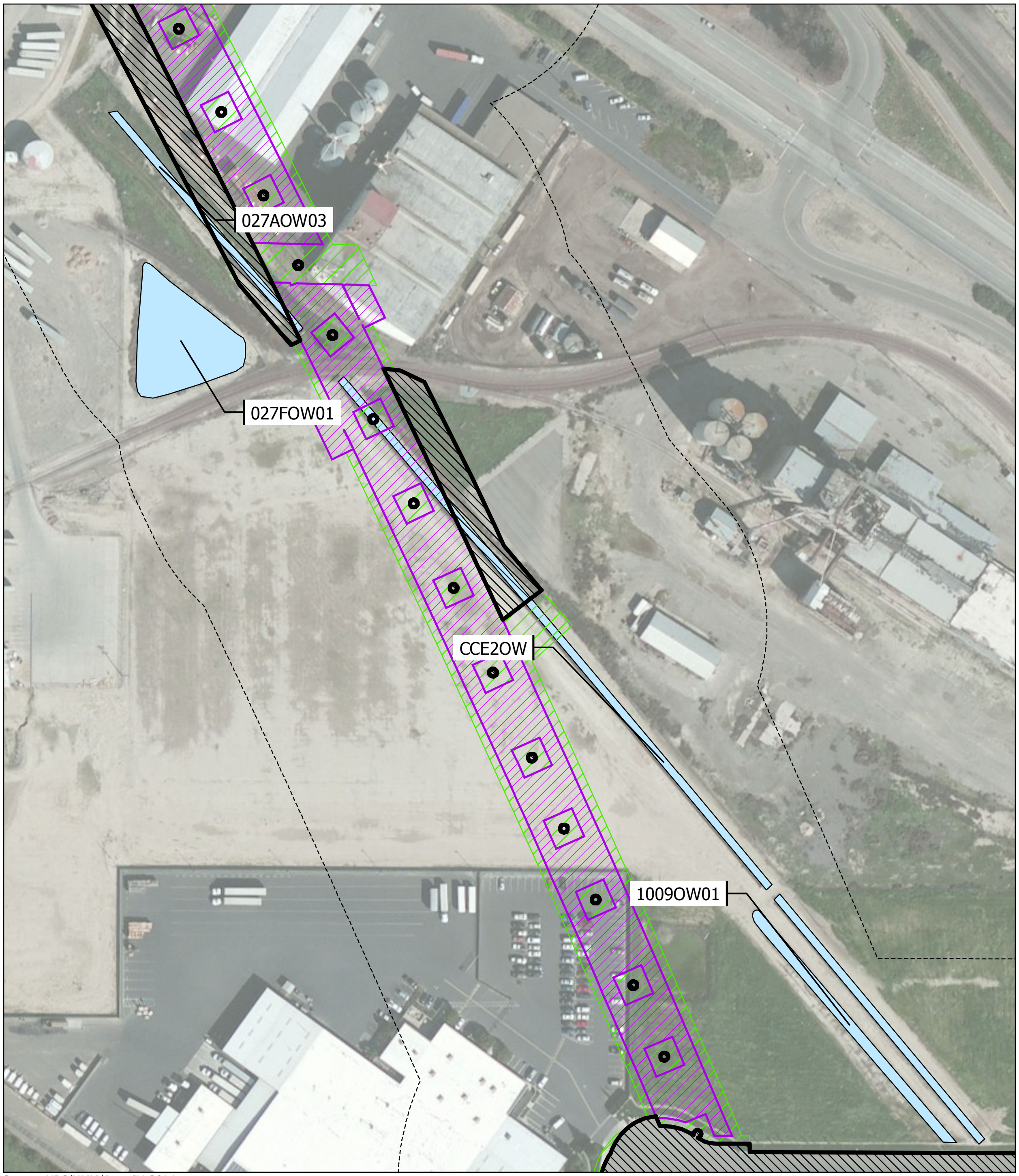
Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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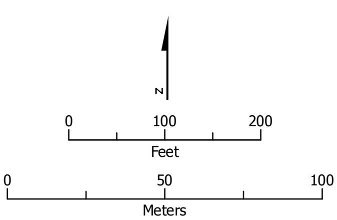
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Project Impact Mapbook
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

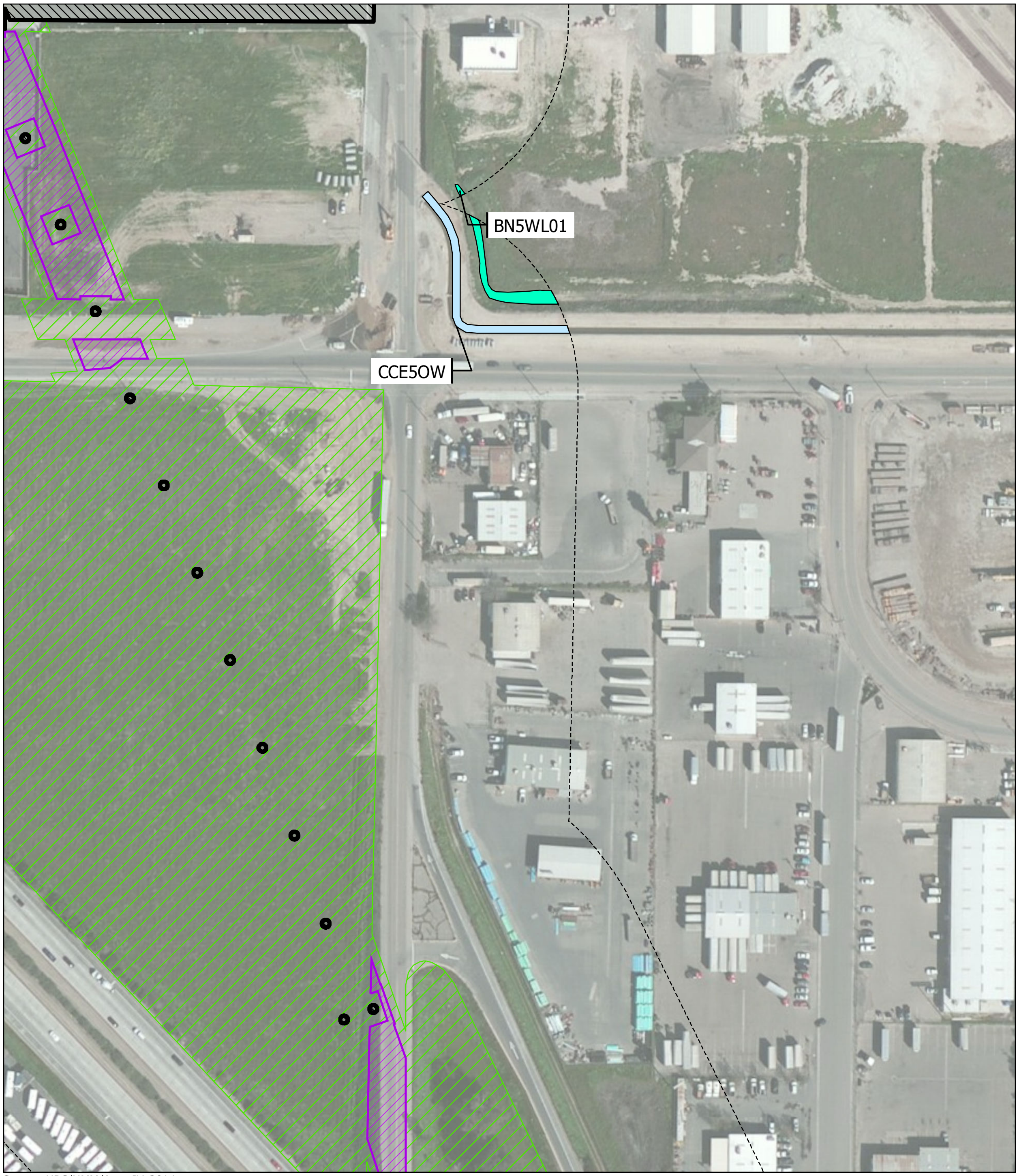

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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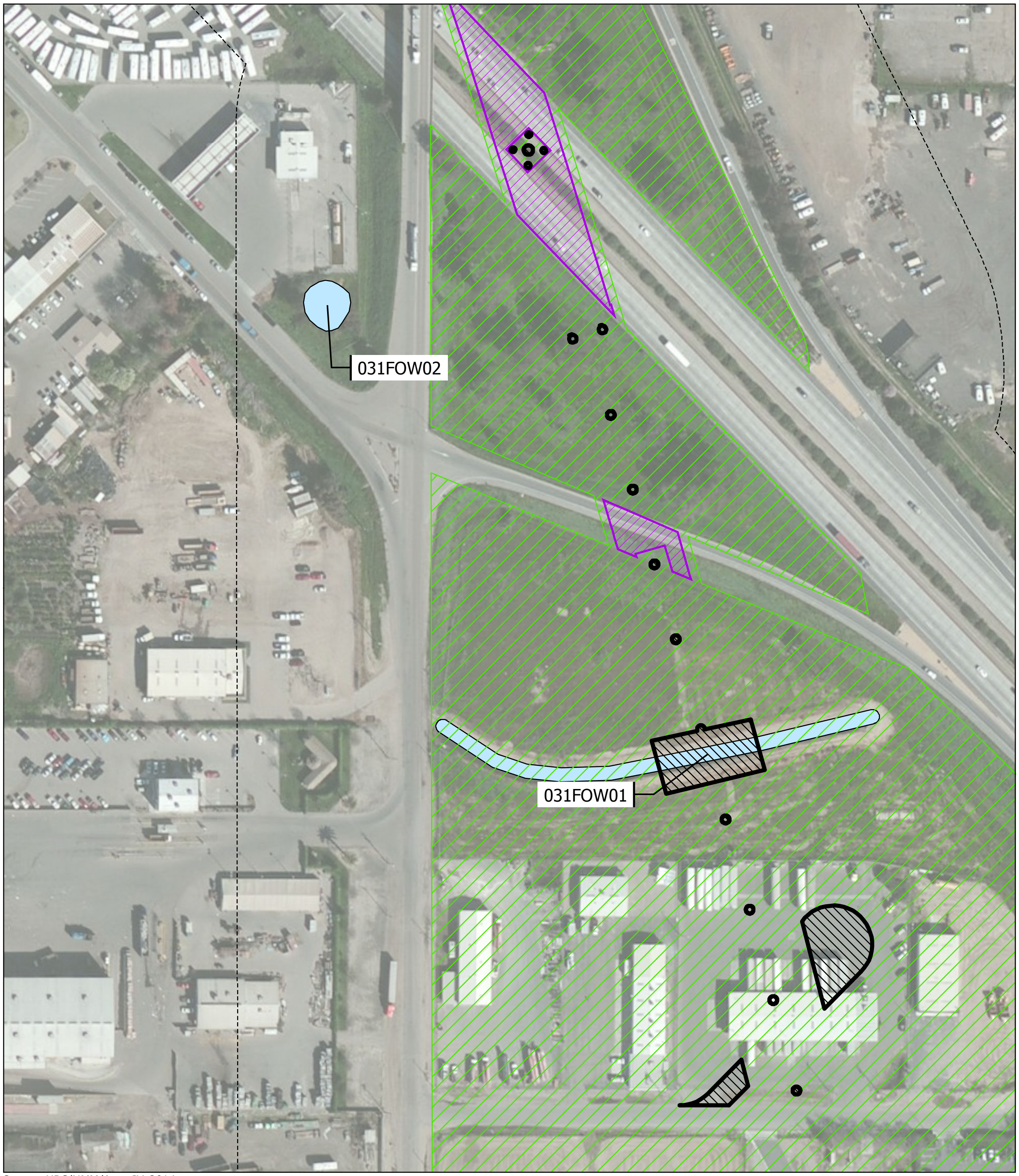

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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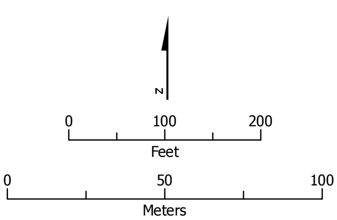
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

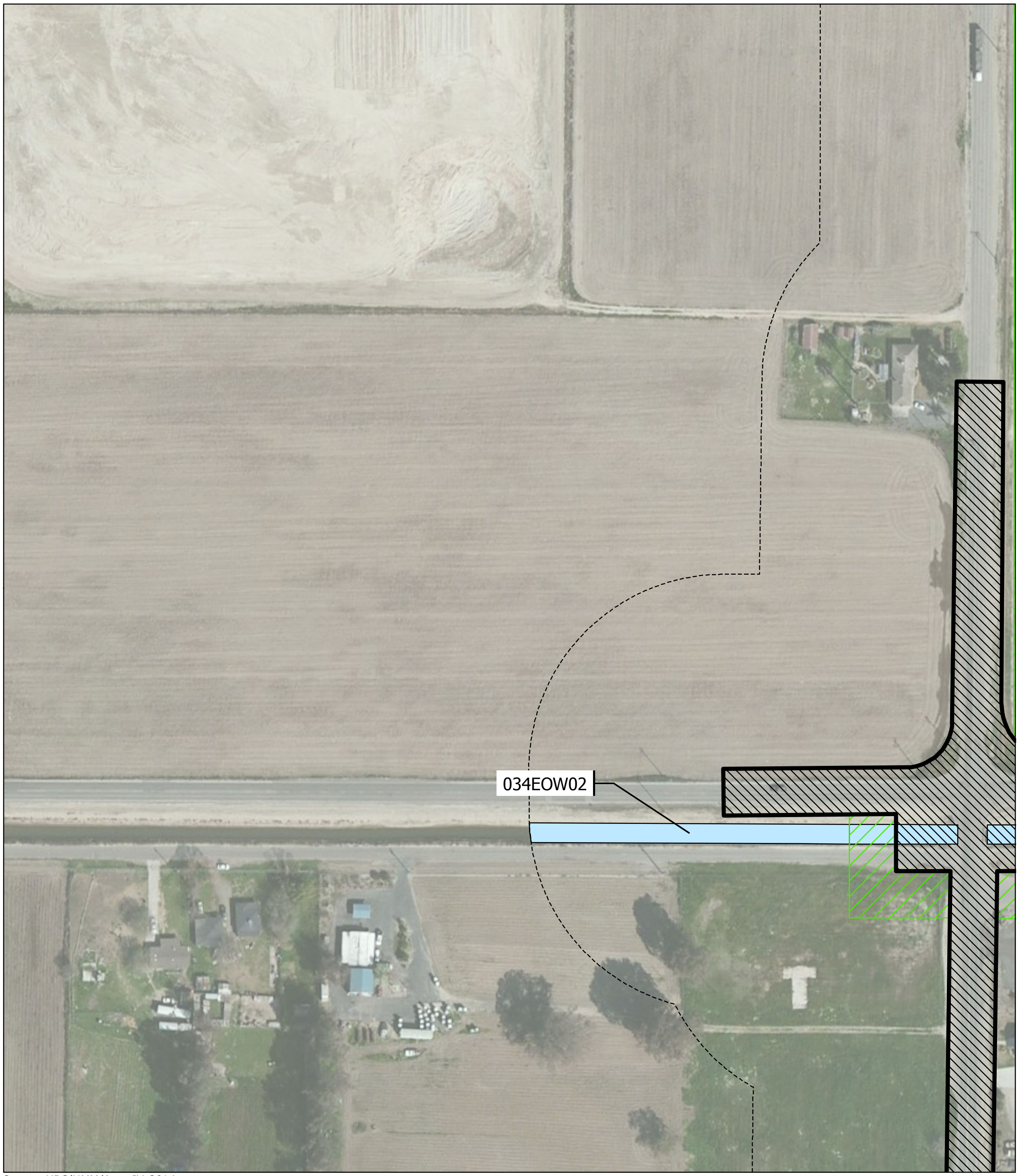
Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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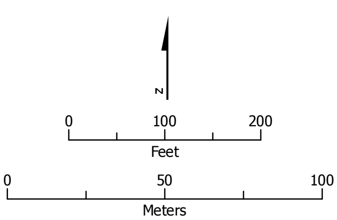
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

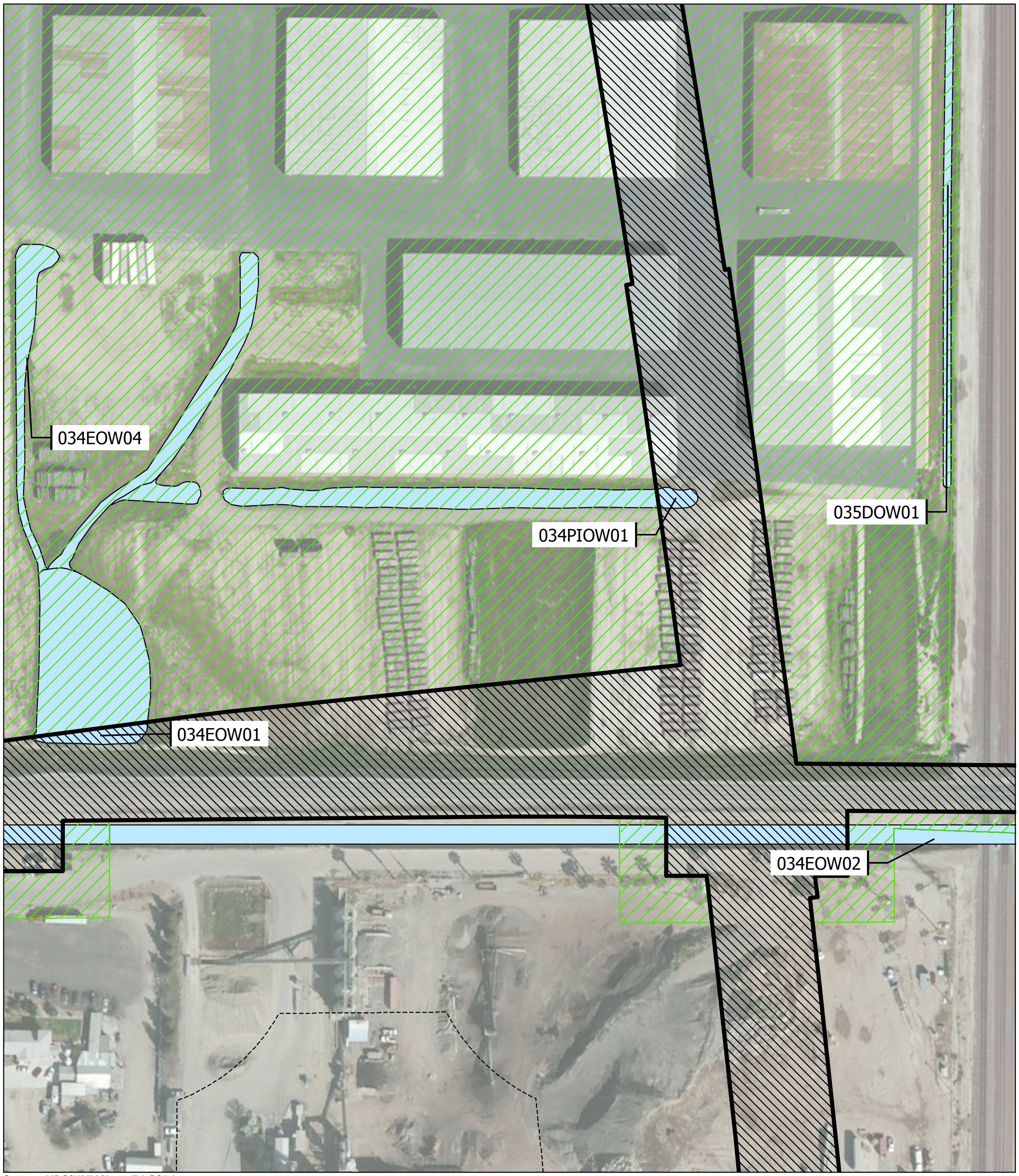

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
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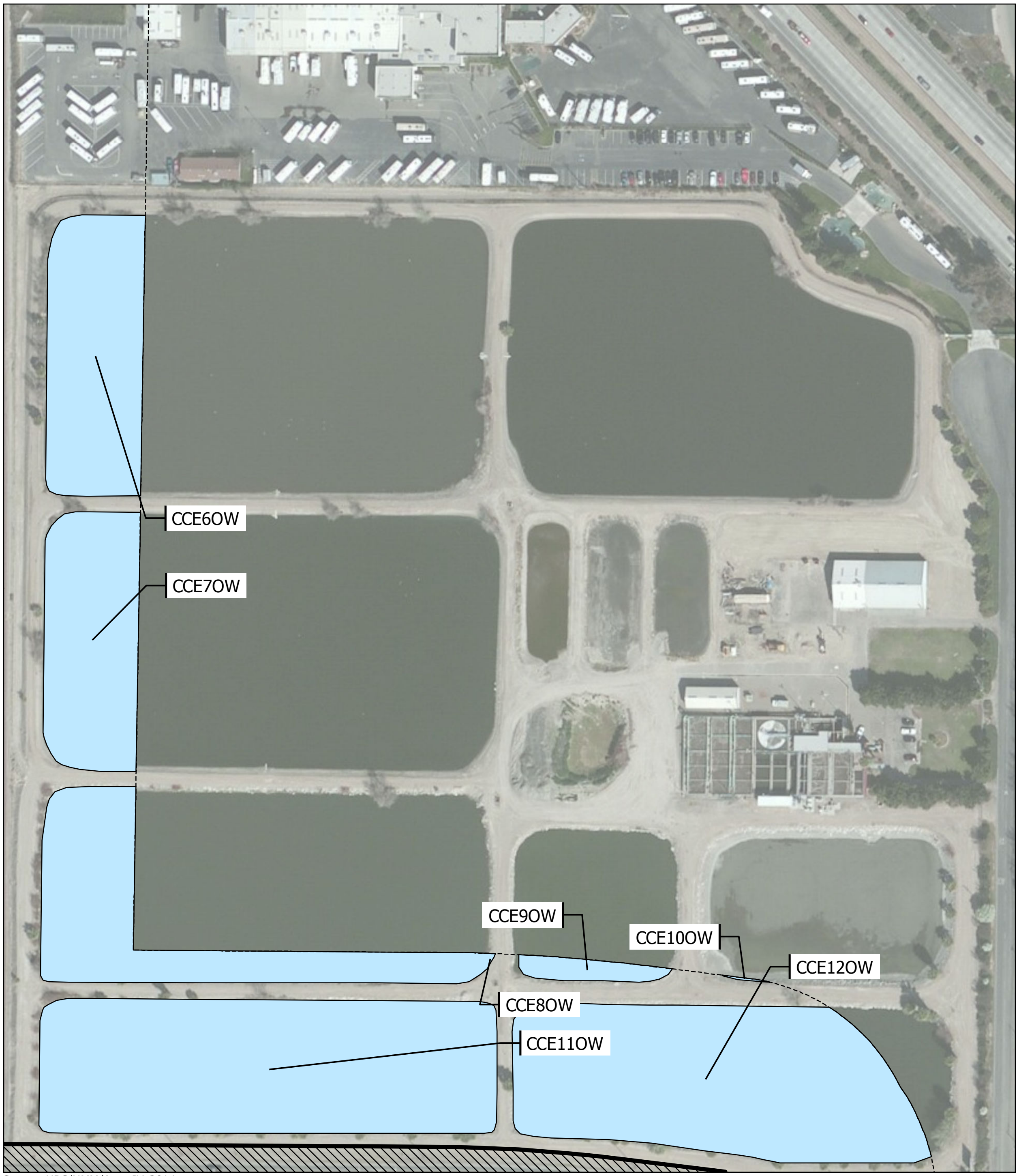

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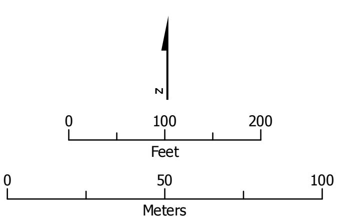
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

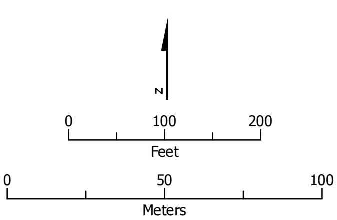
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

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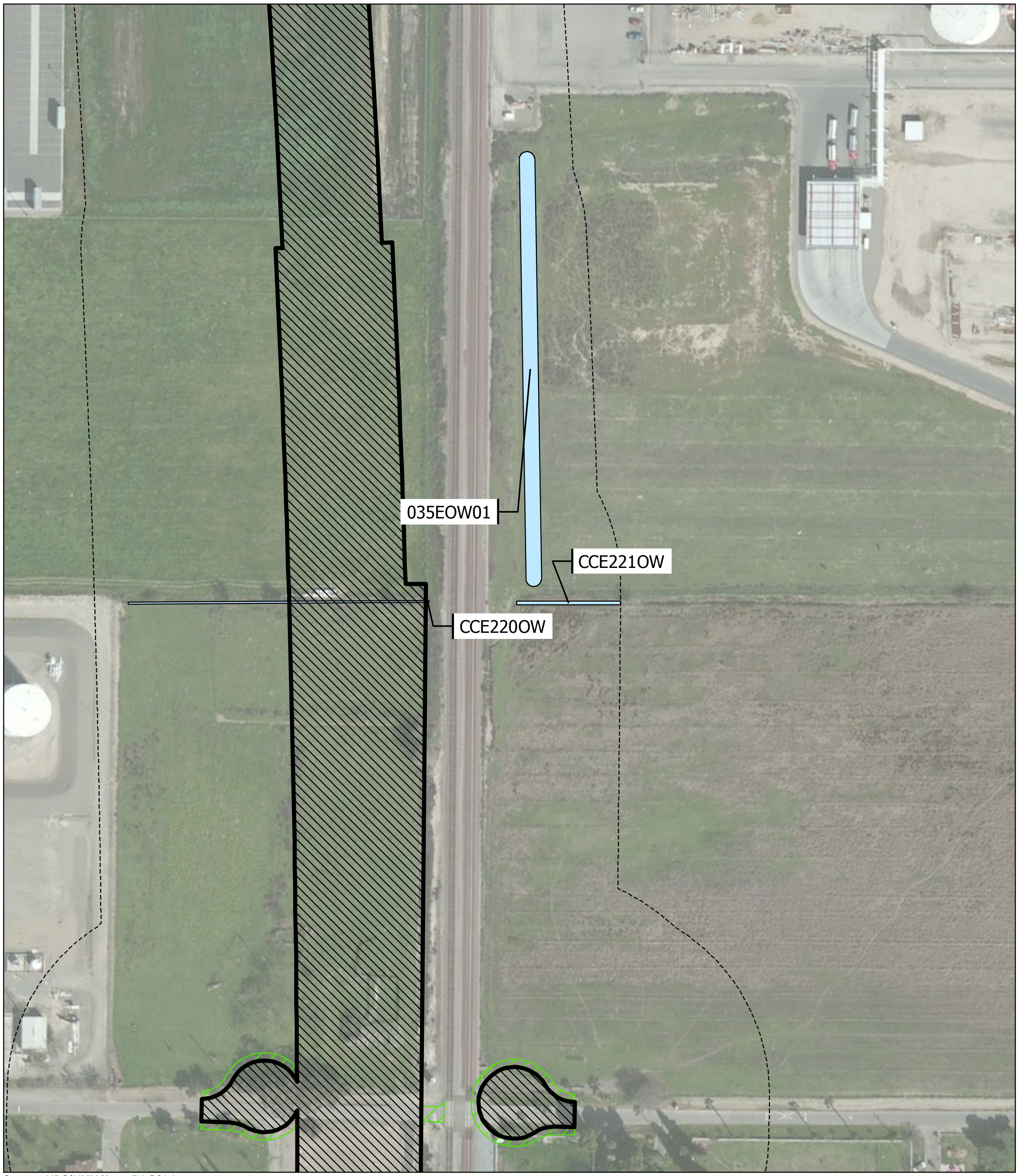
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014



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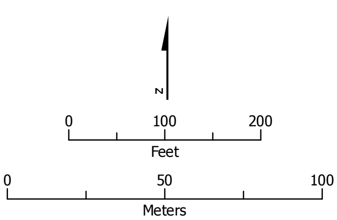

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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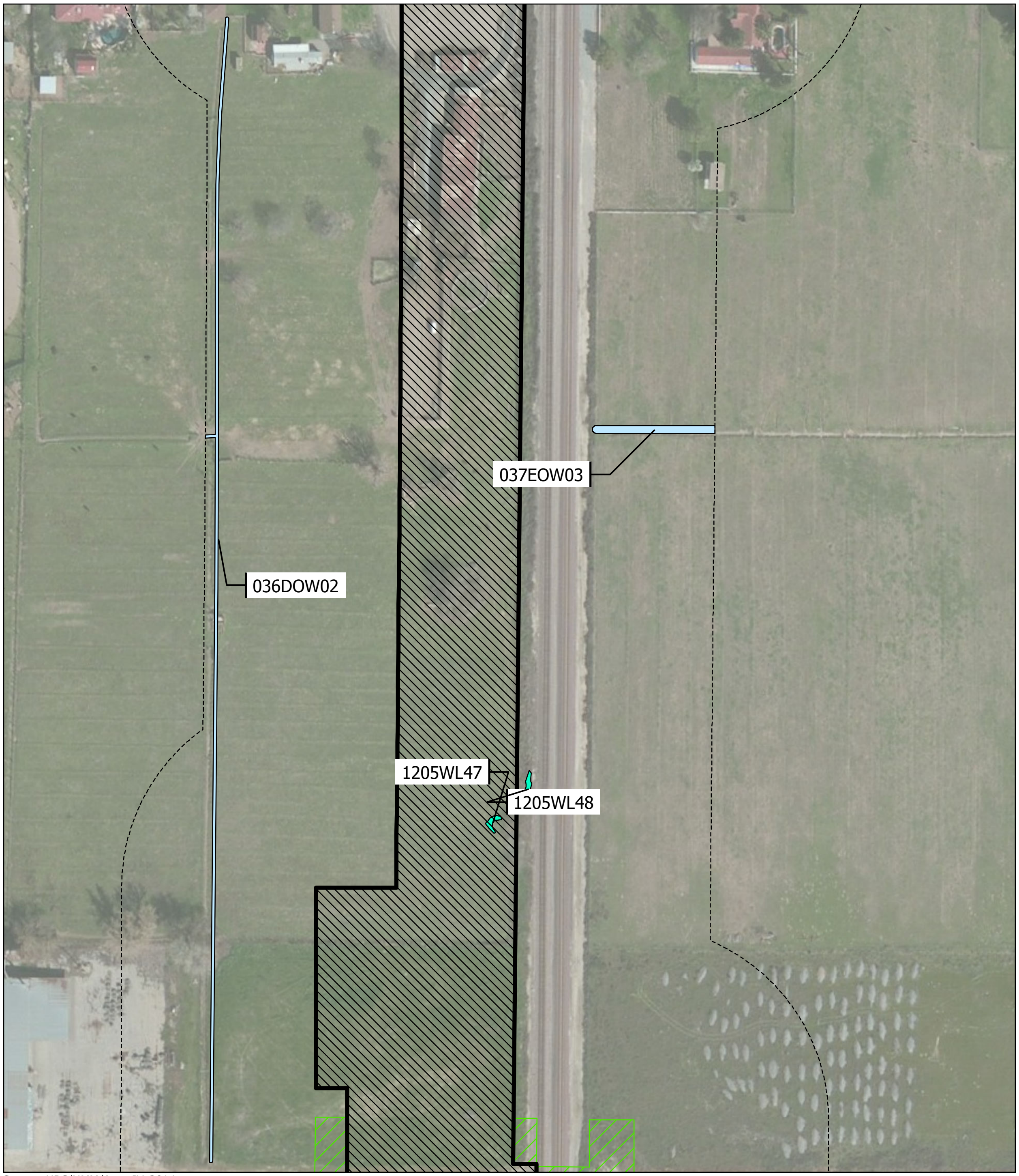

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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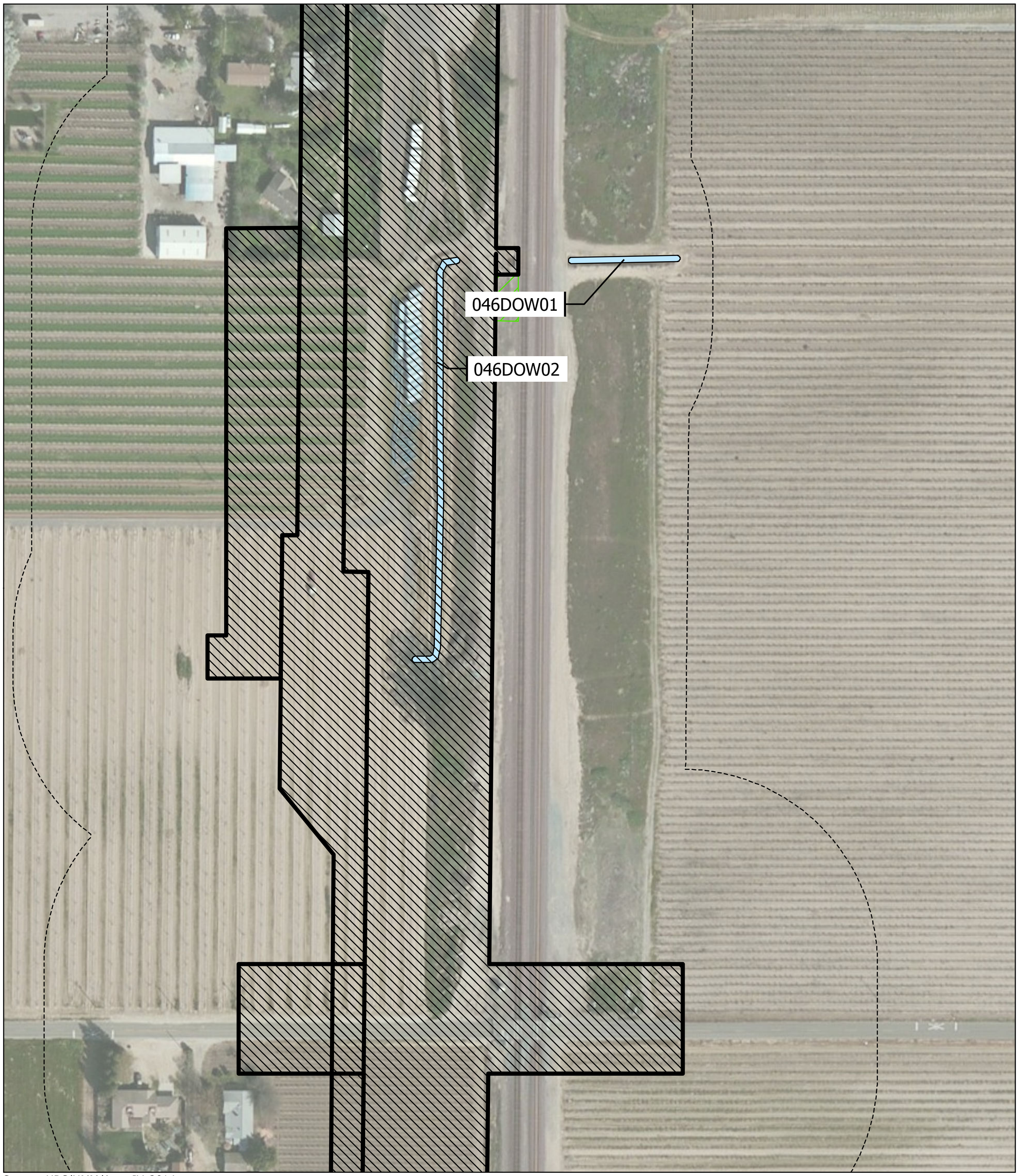
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014



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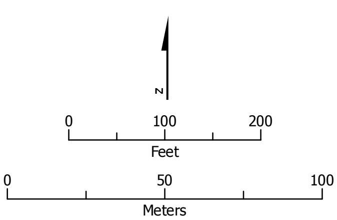
January 22, 2014



250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

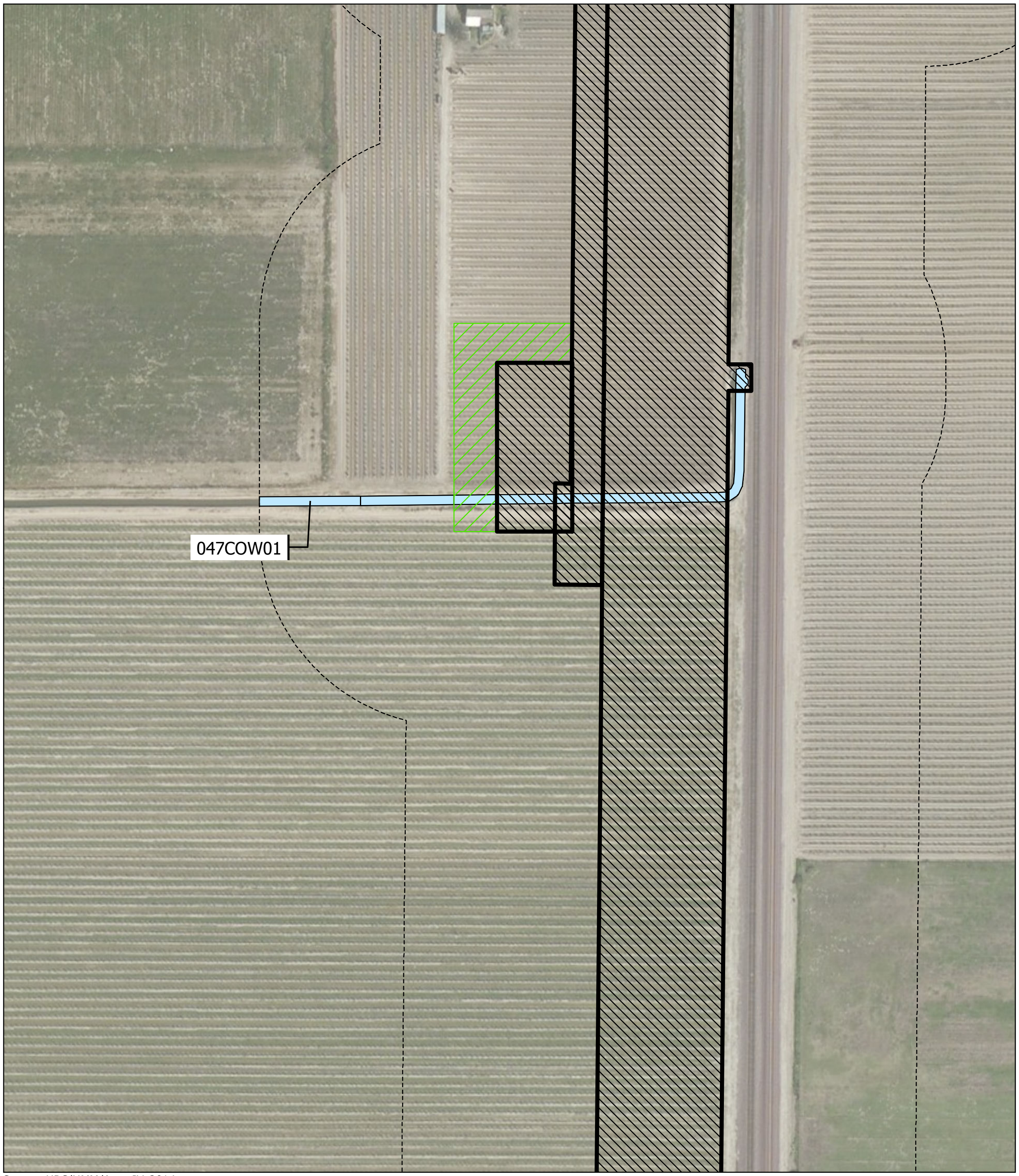


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

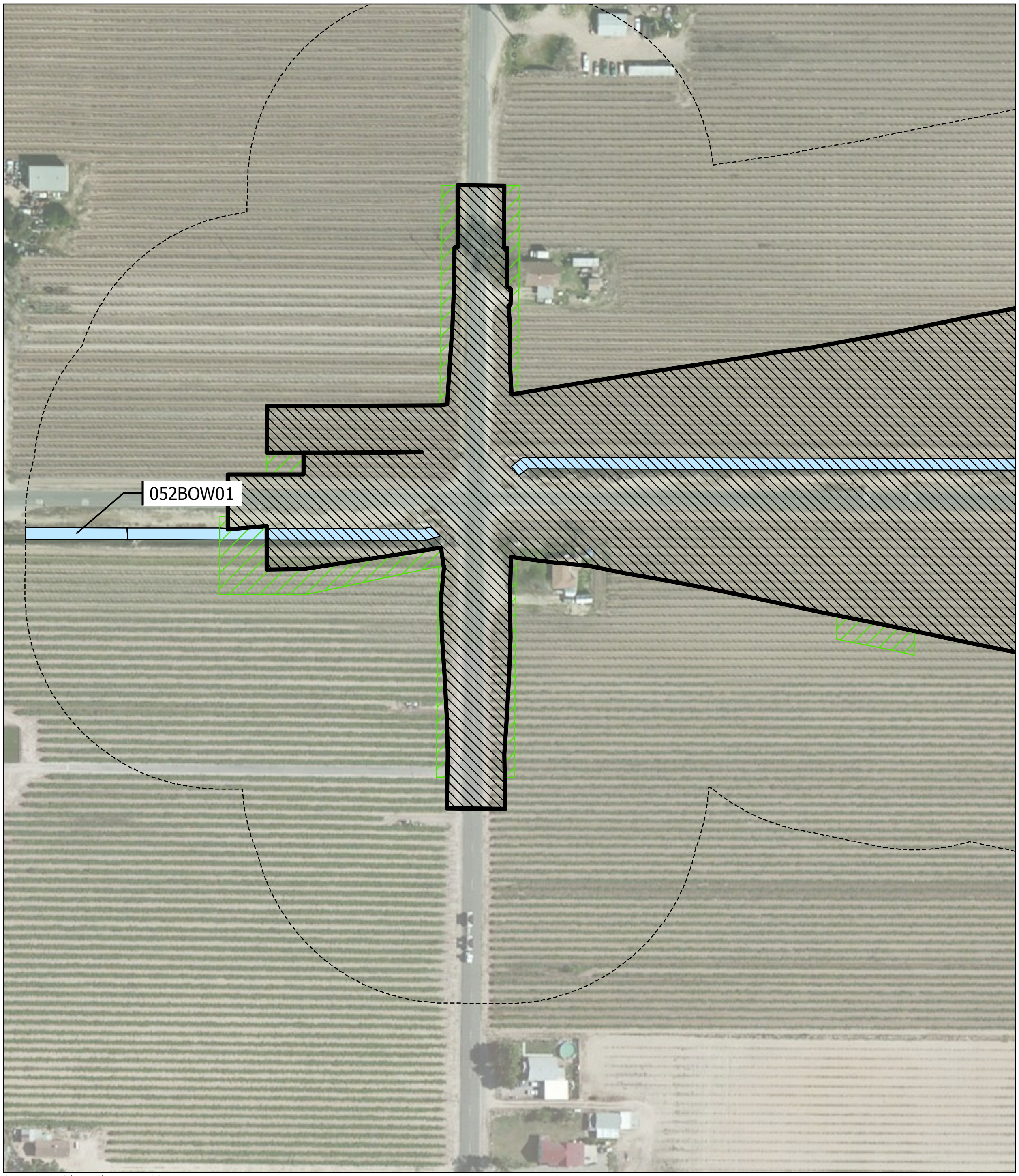

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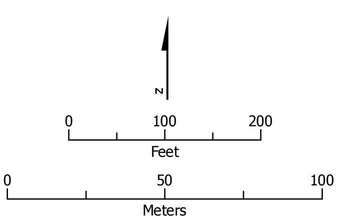
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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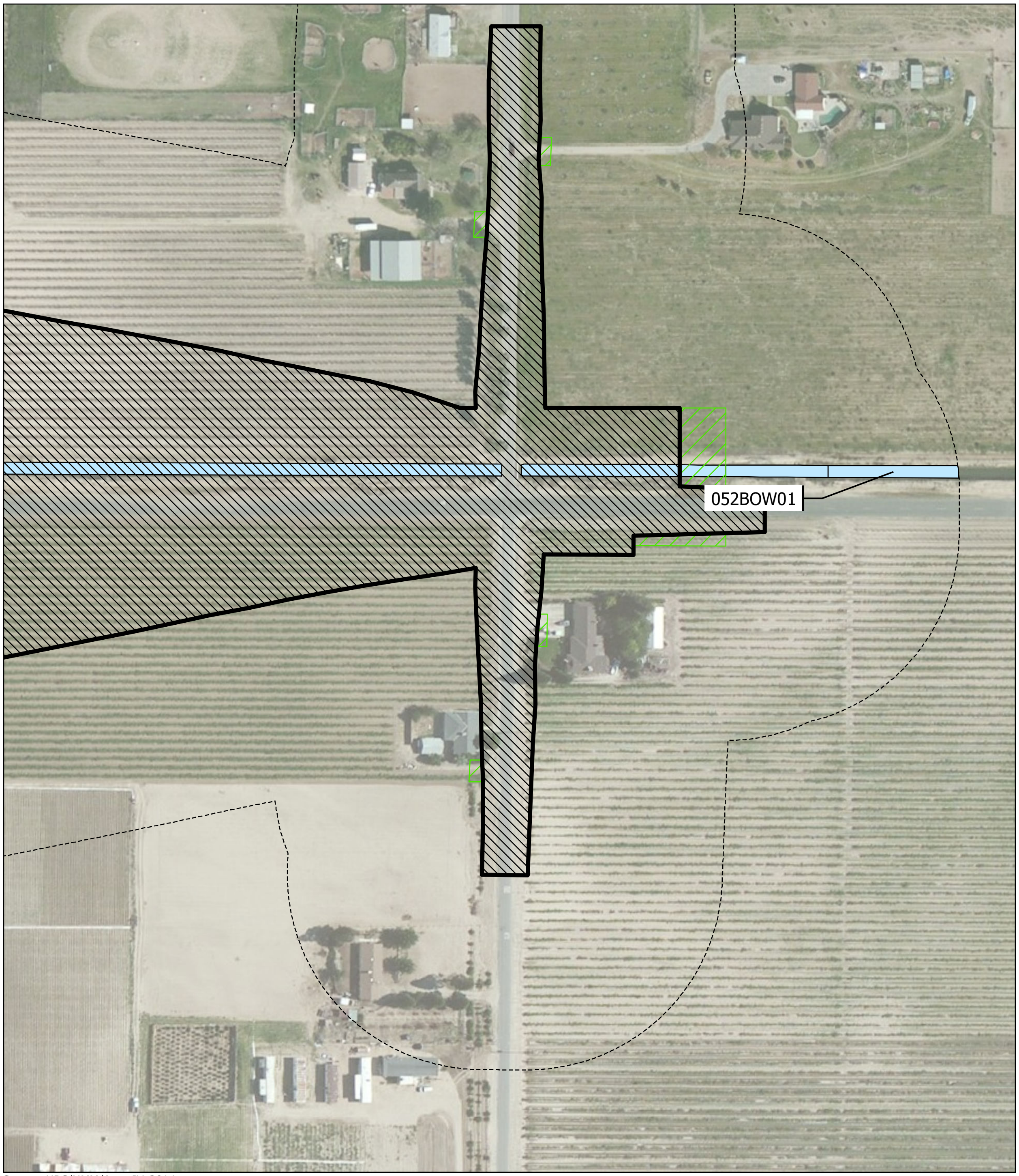
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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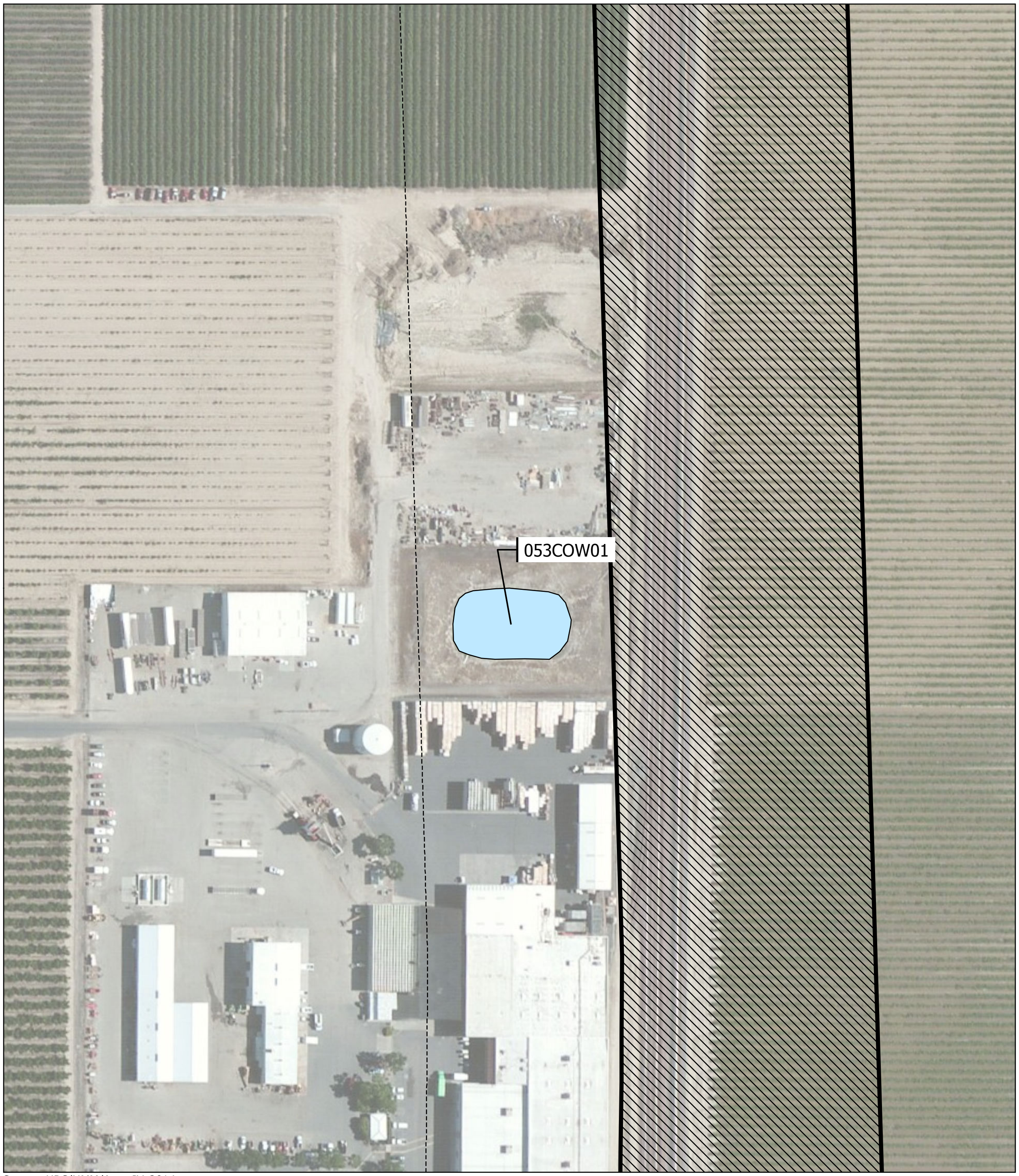

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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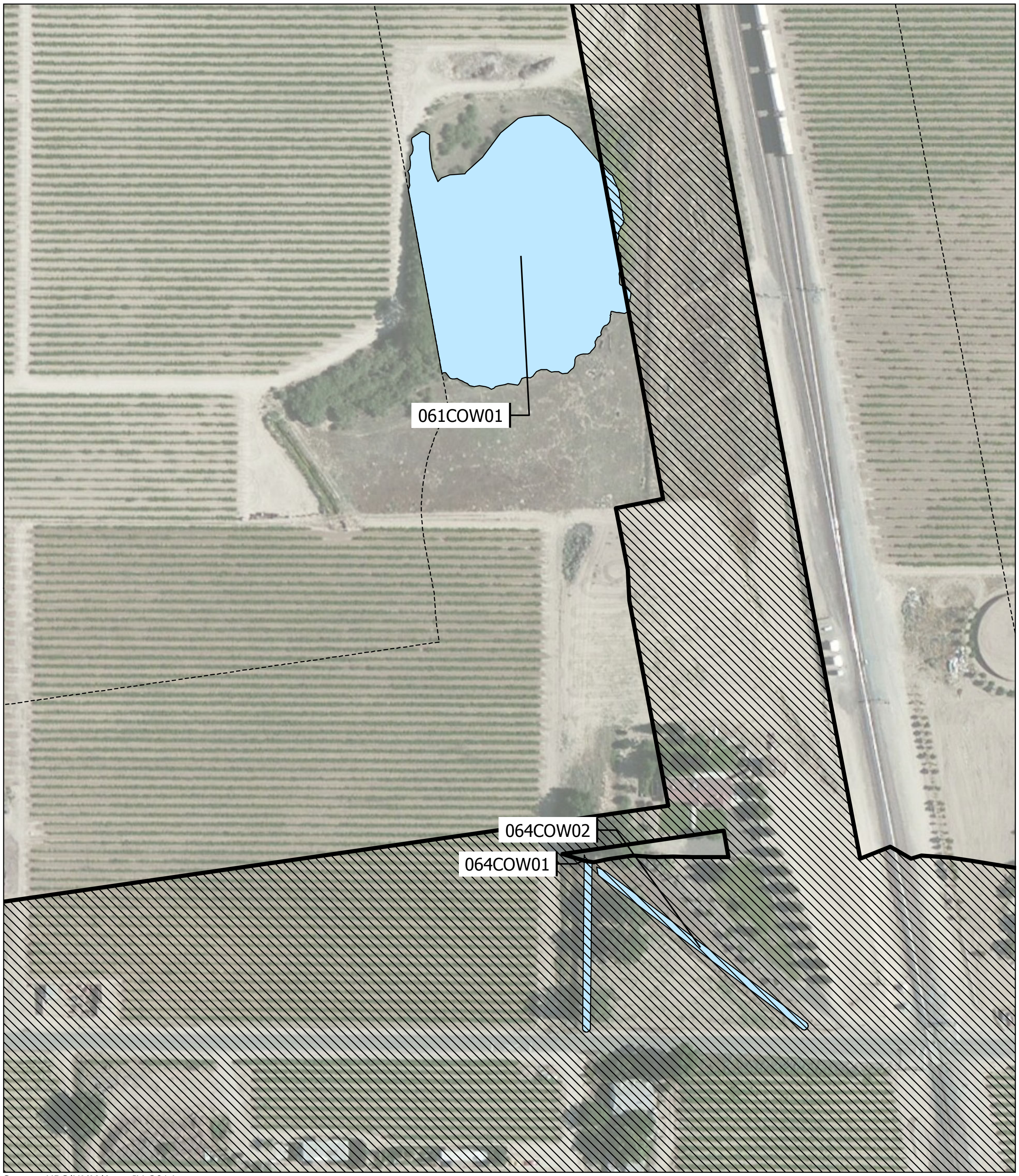
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA
Impact Type
Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N
0 100 200
Feet
0 50 100
Meters

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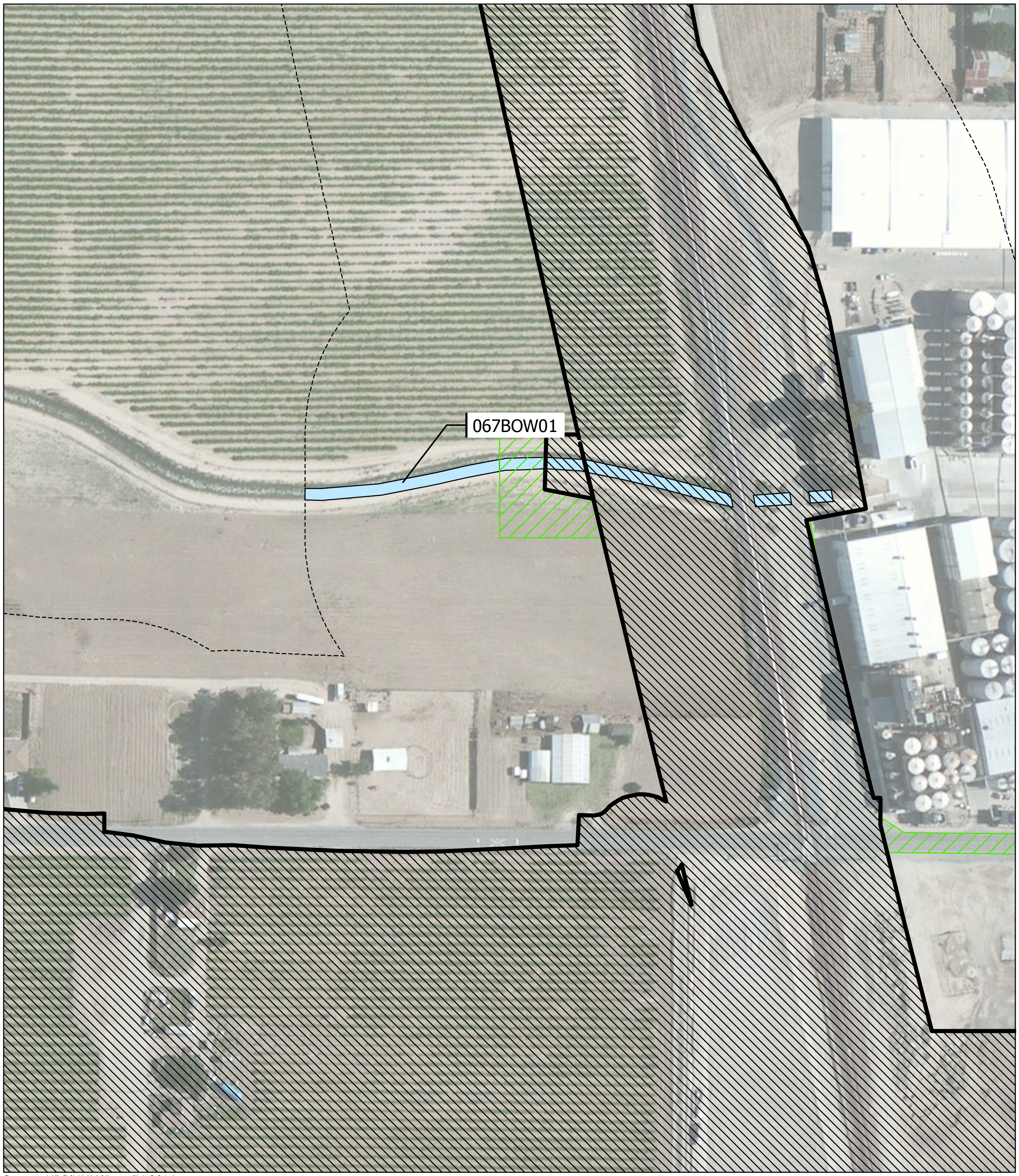

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

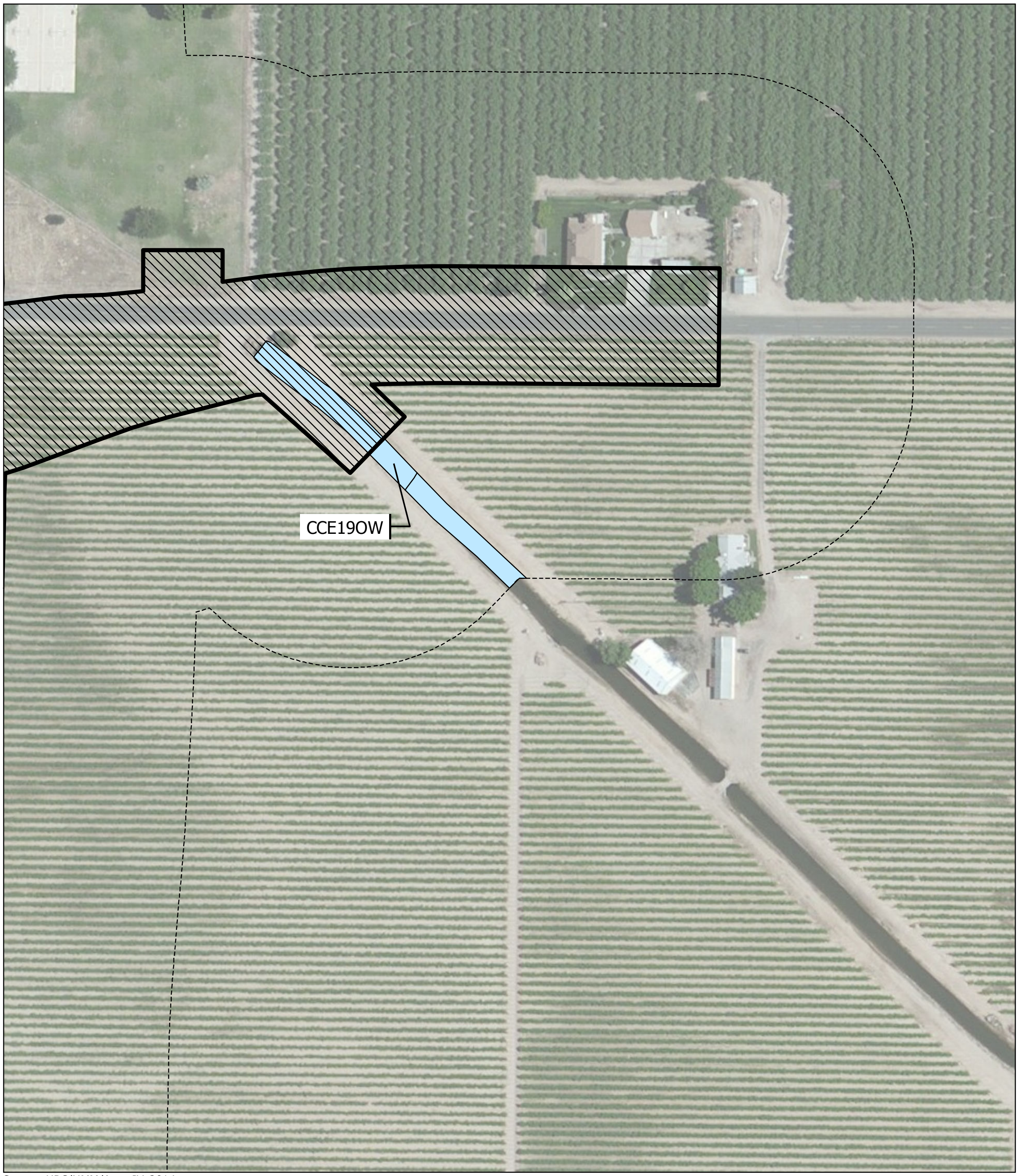

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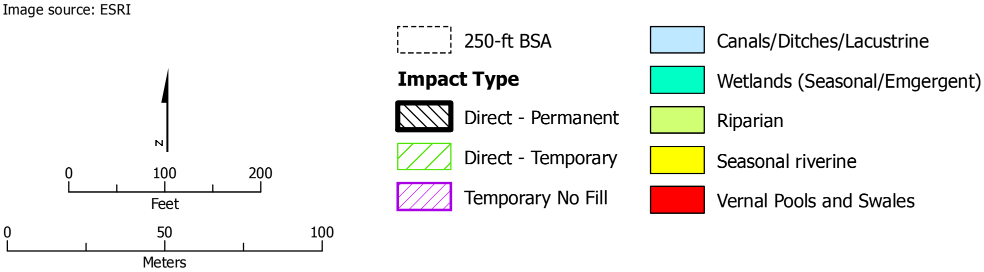
Image source: ESRI

January 22, 2014



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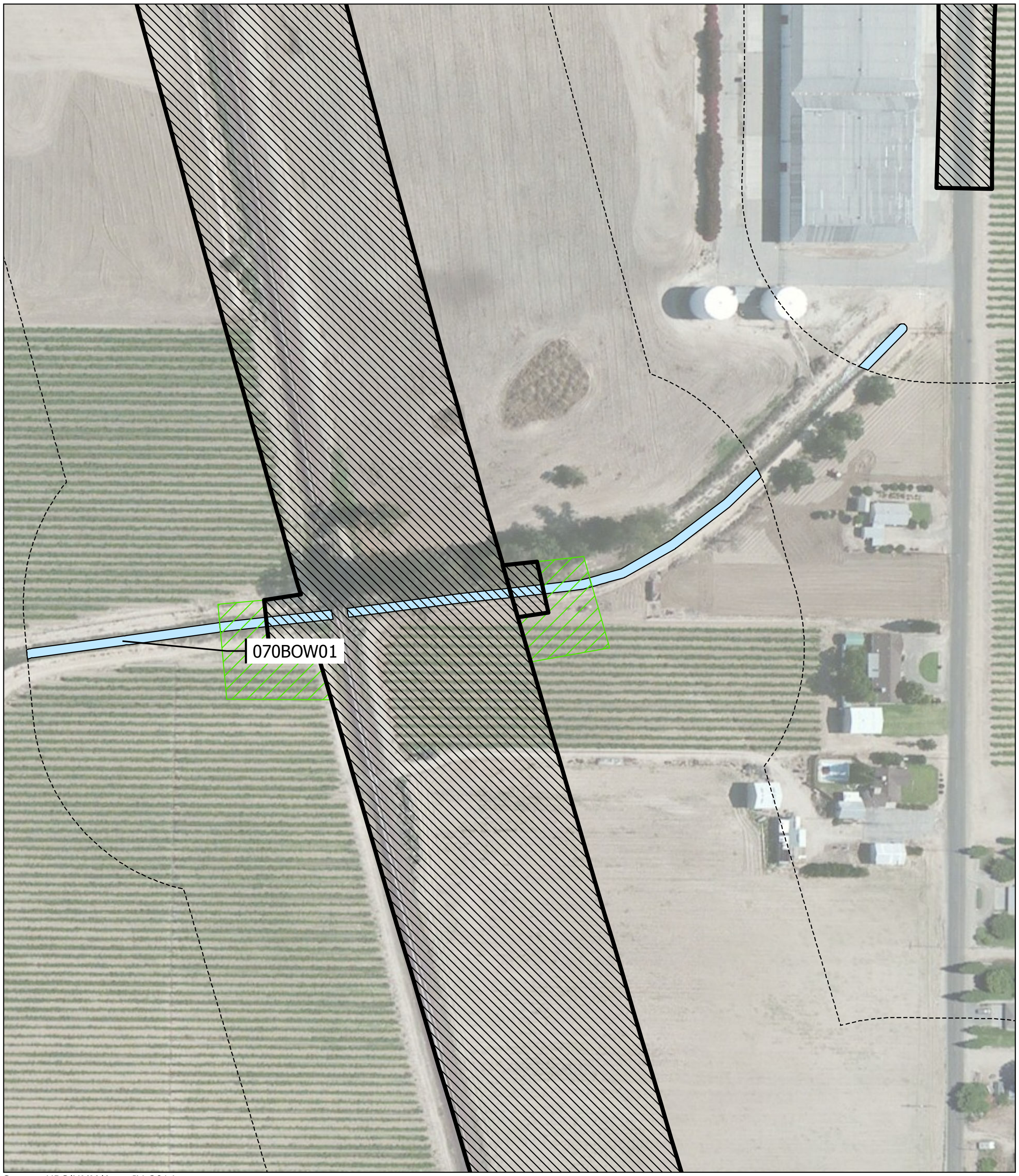

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Image source: ESRI

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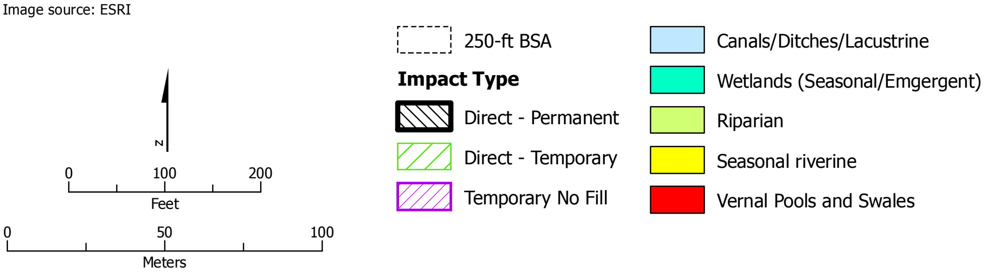

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

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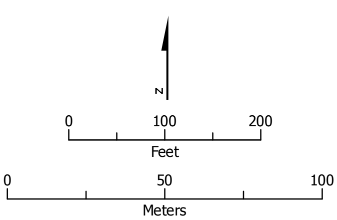
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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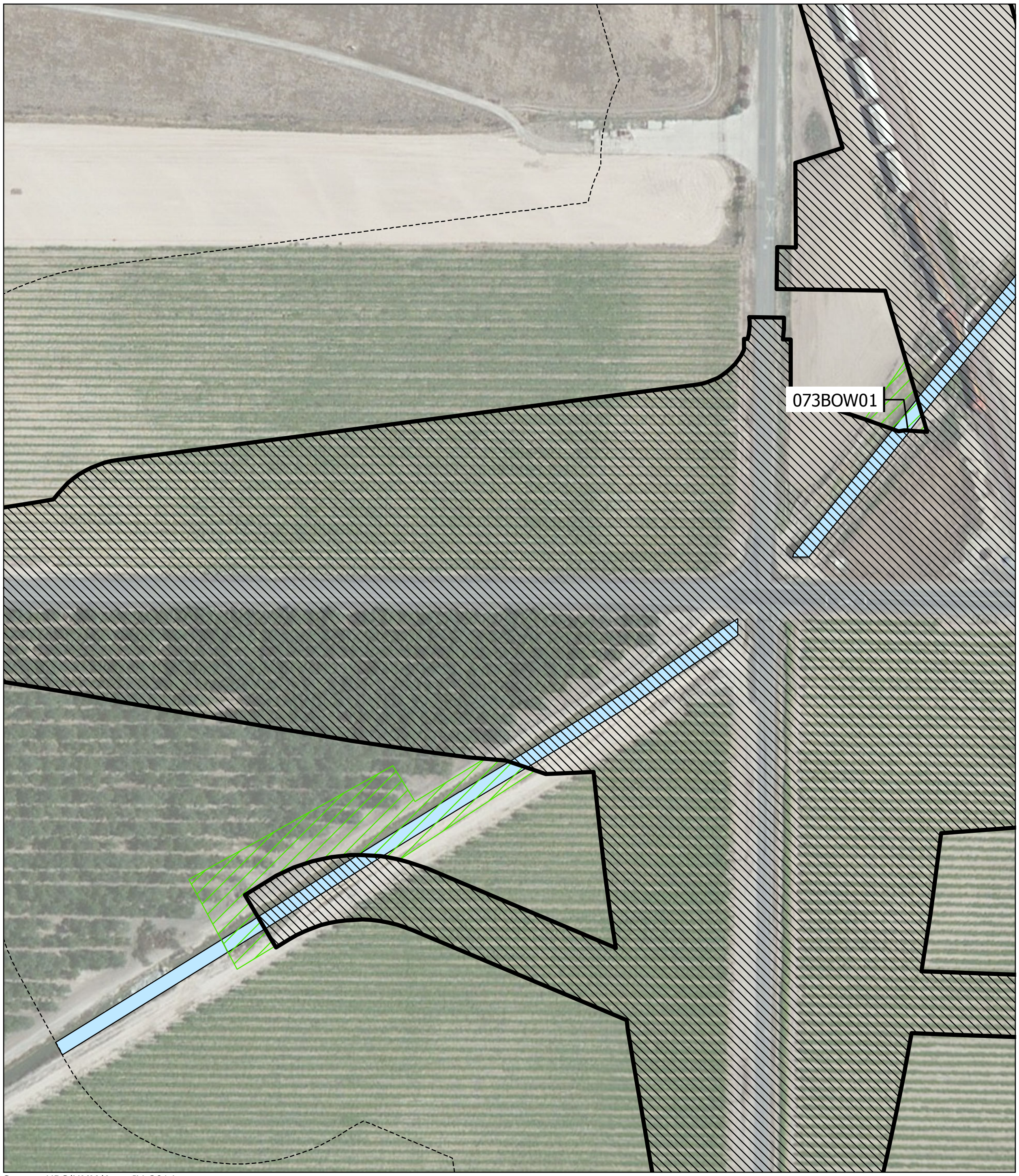
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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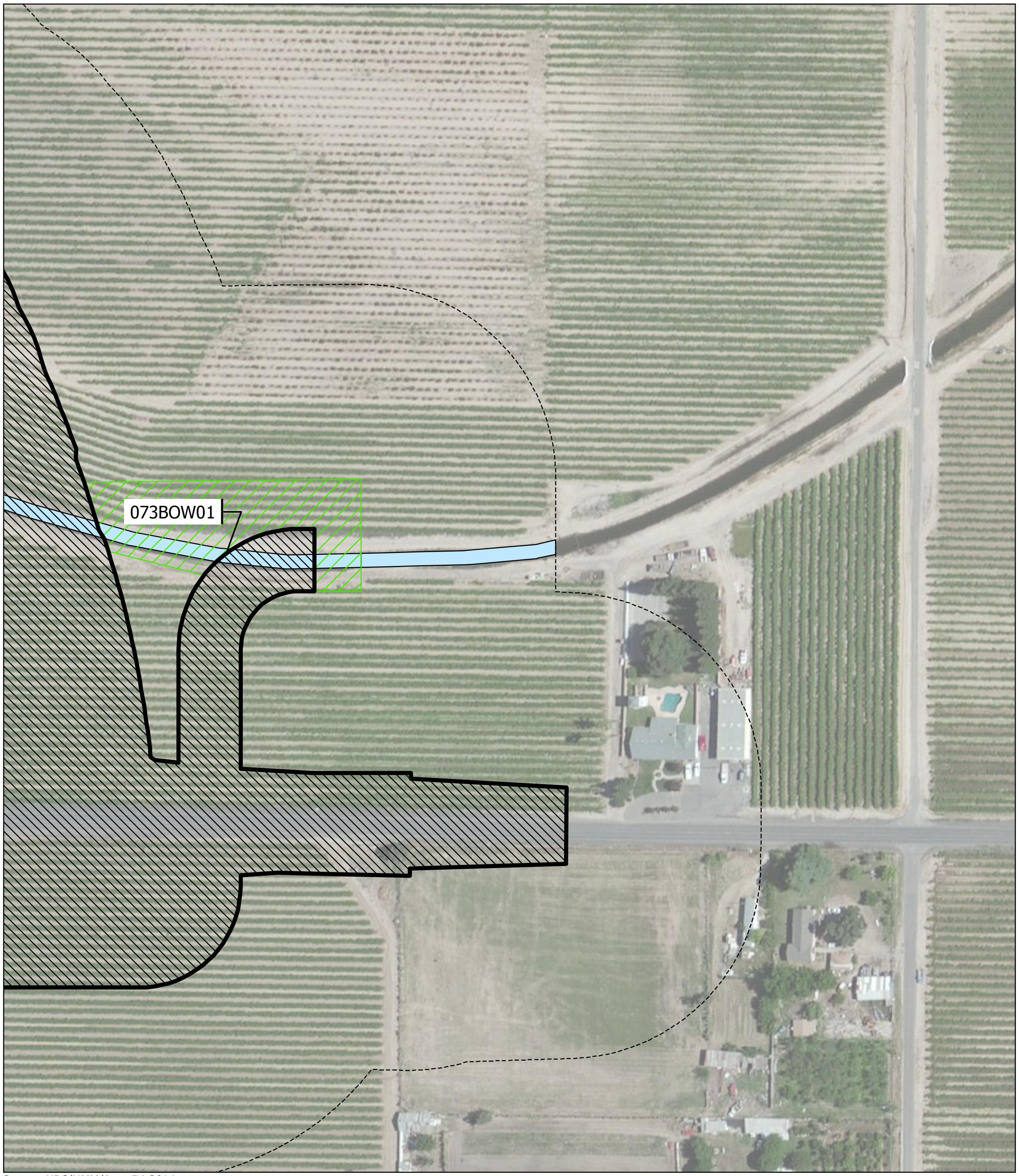

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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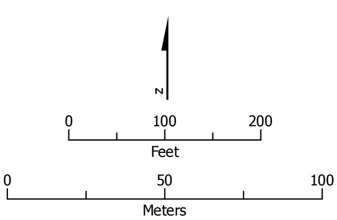
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

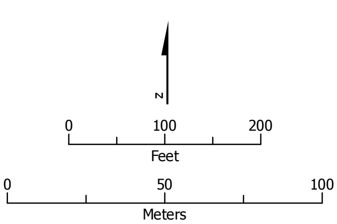
- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Project Impact Mapbook

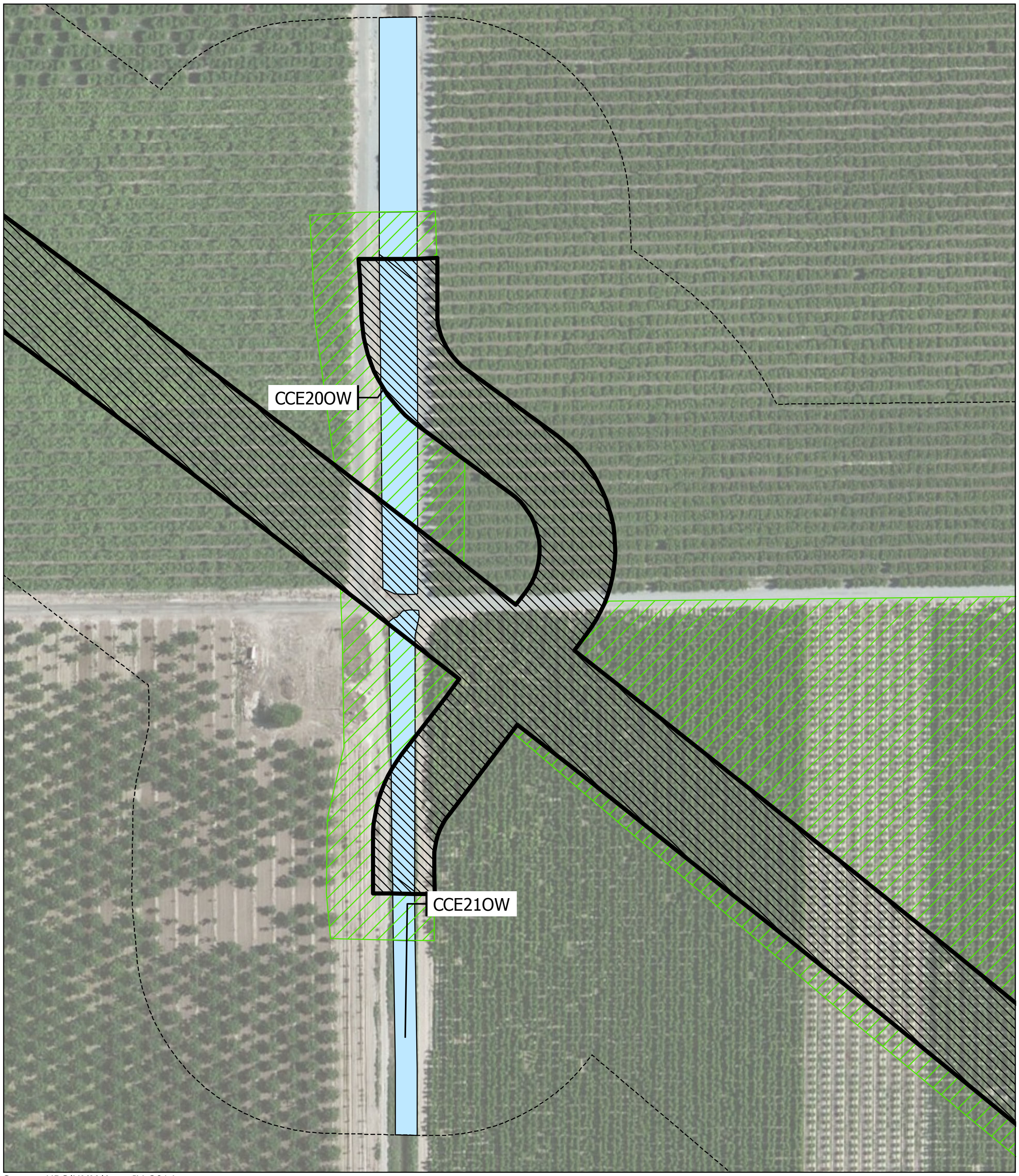

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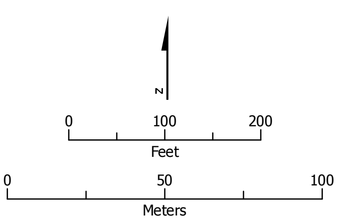
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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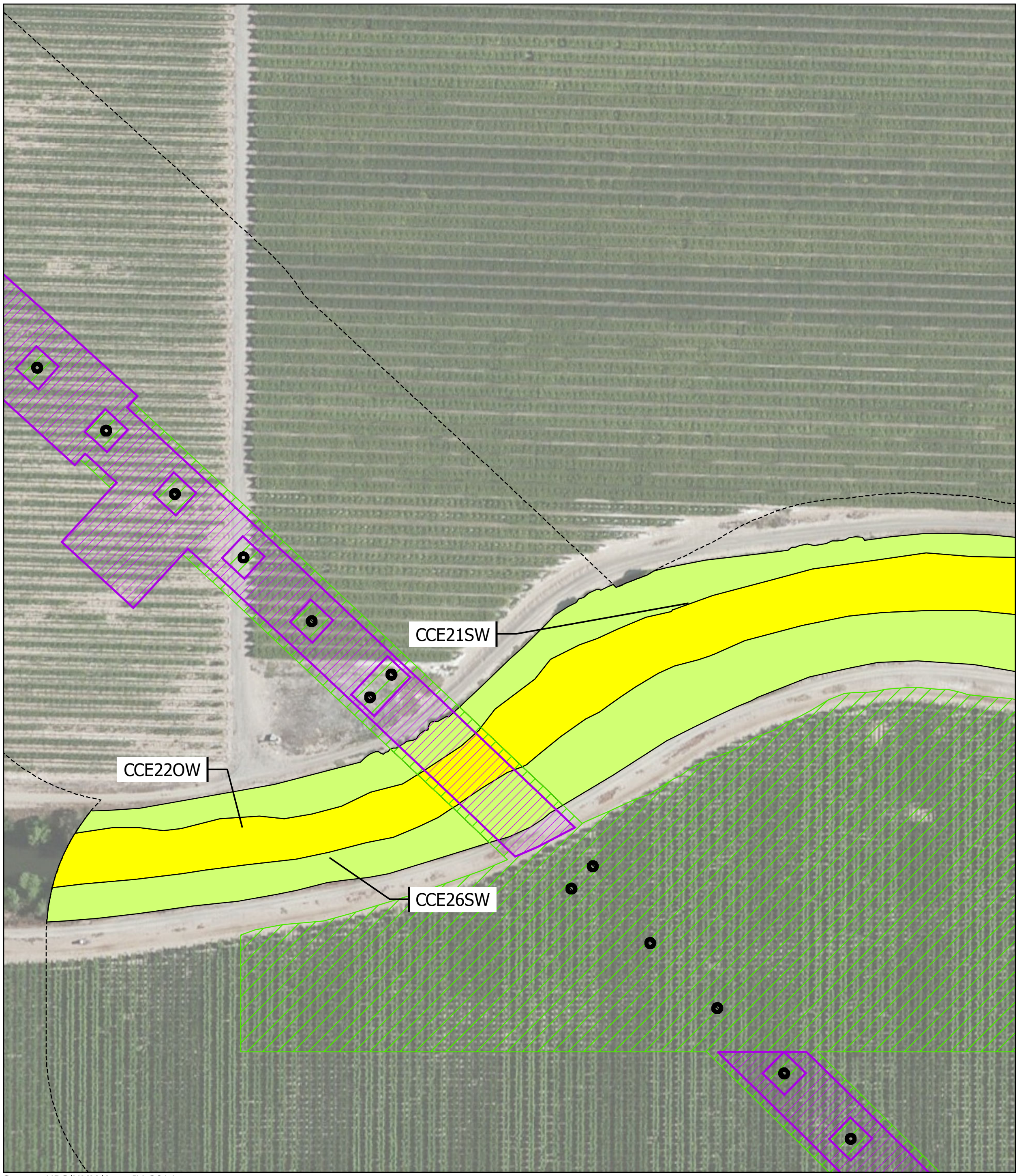

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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RFP No.: 13-57 – Addendum No. 5 - 10/09/2014

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

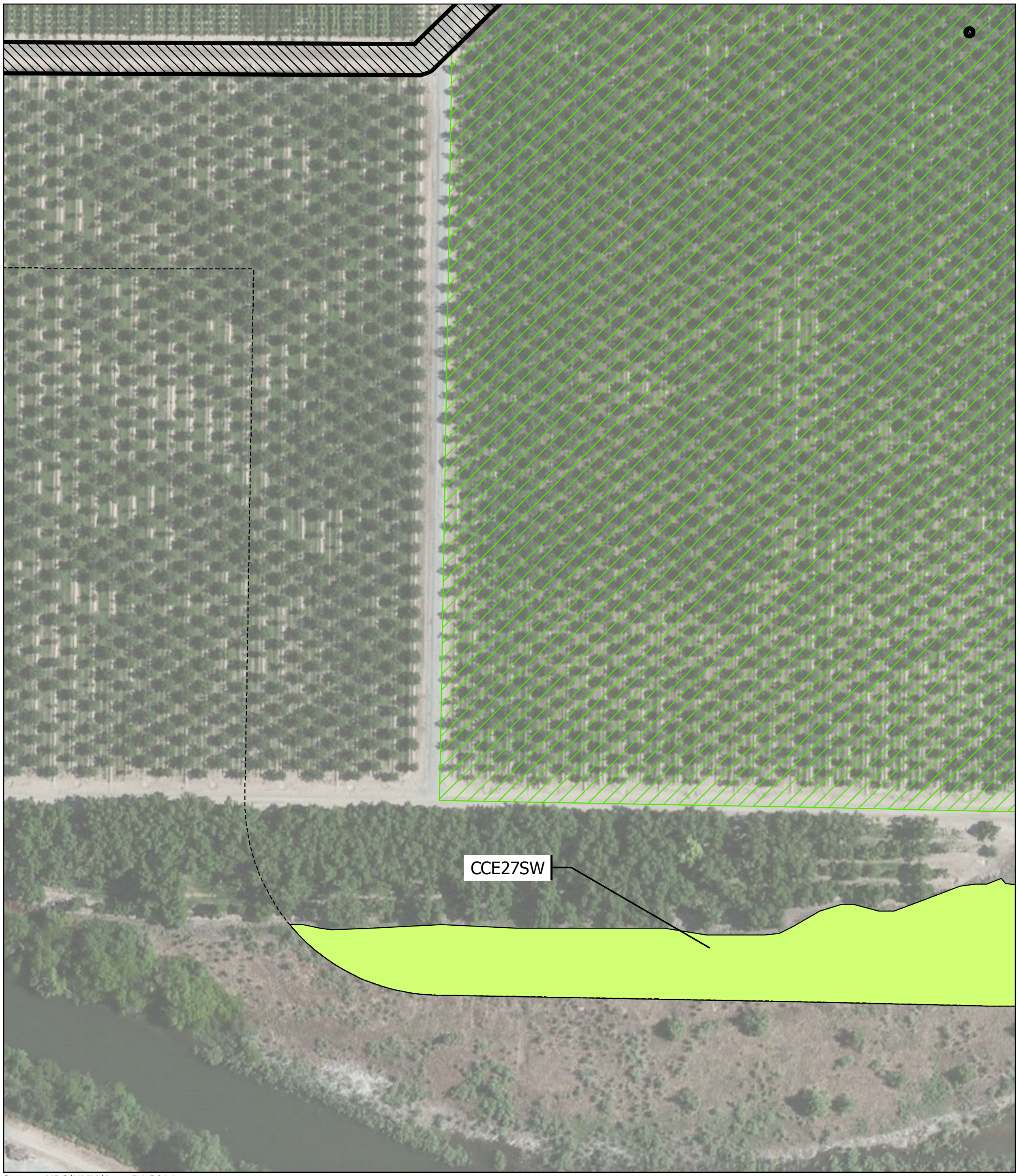

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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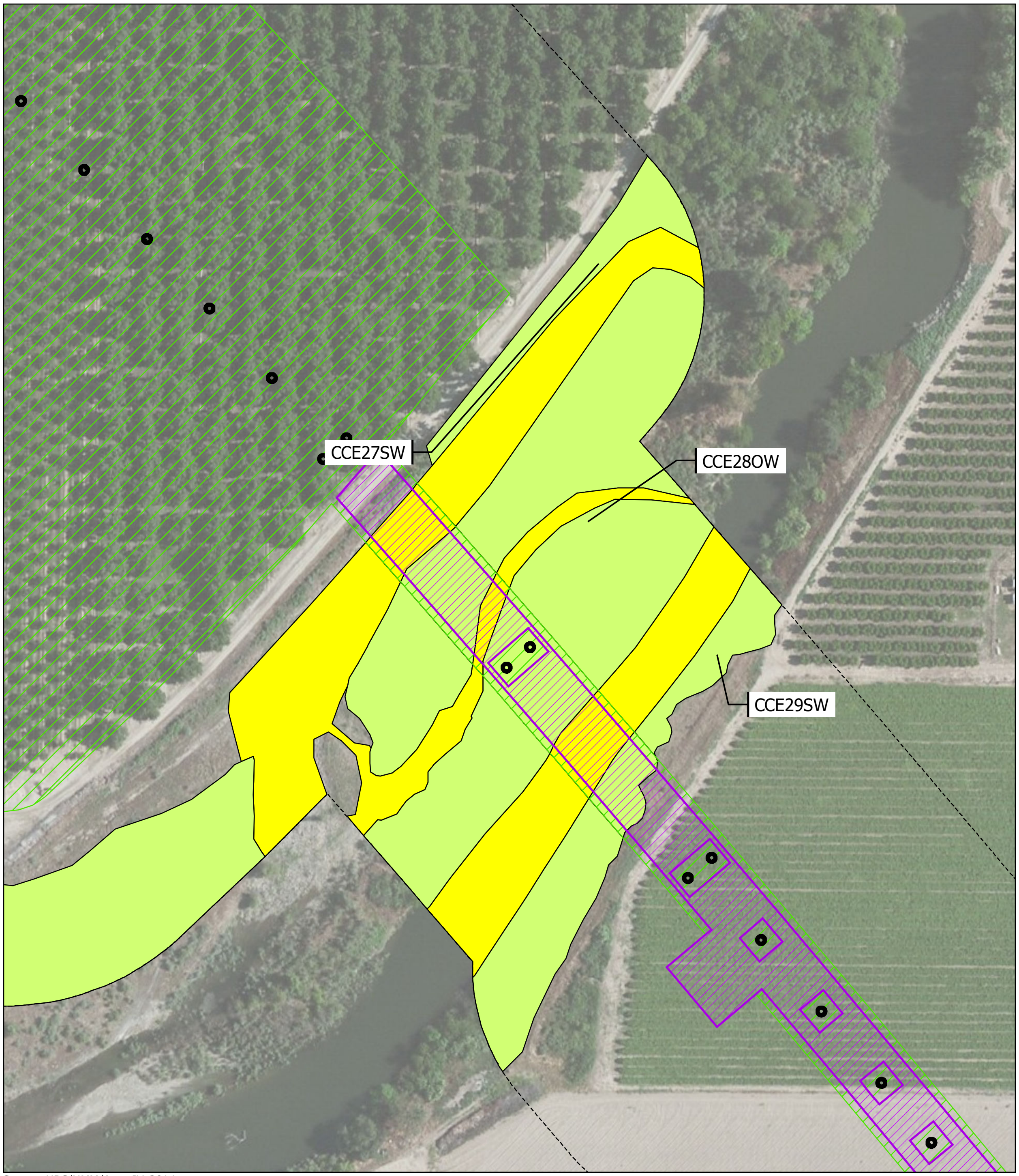
RFP No.: 13-57 – Addendum No. 5 - 10/09/2014



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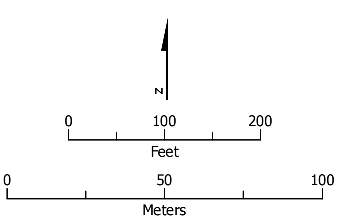

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

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Project Impact Mapbook

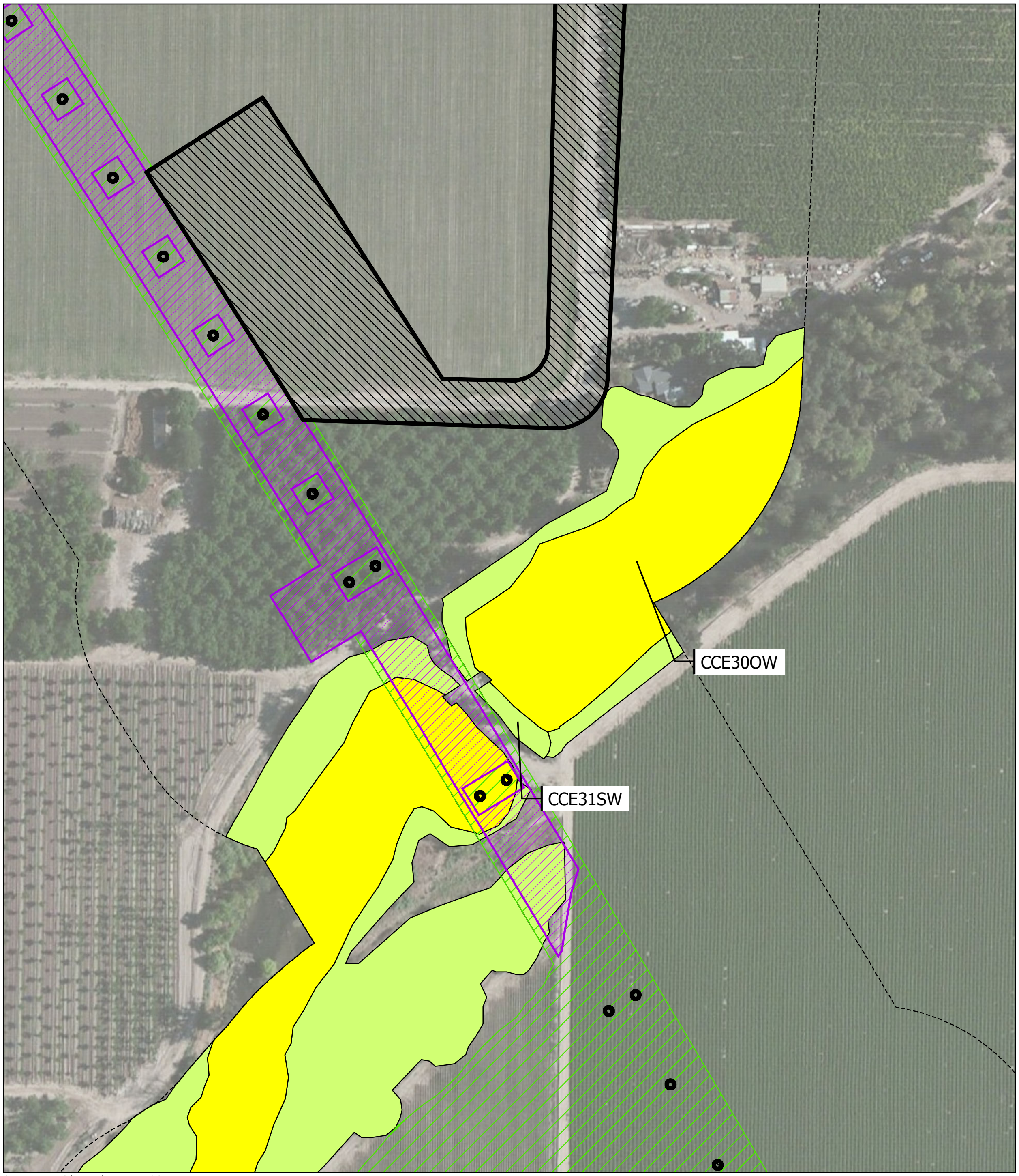

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Image source: ESRI

January 22, 2014

N

0 100 200
Feet

0 50 100
Meters

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

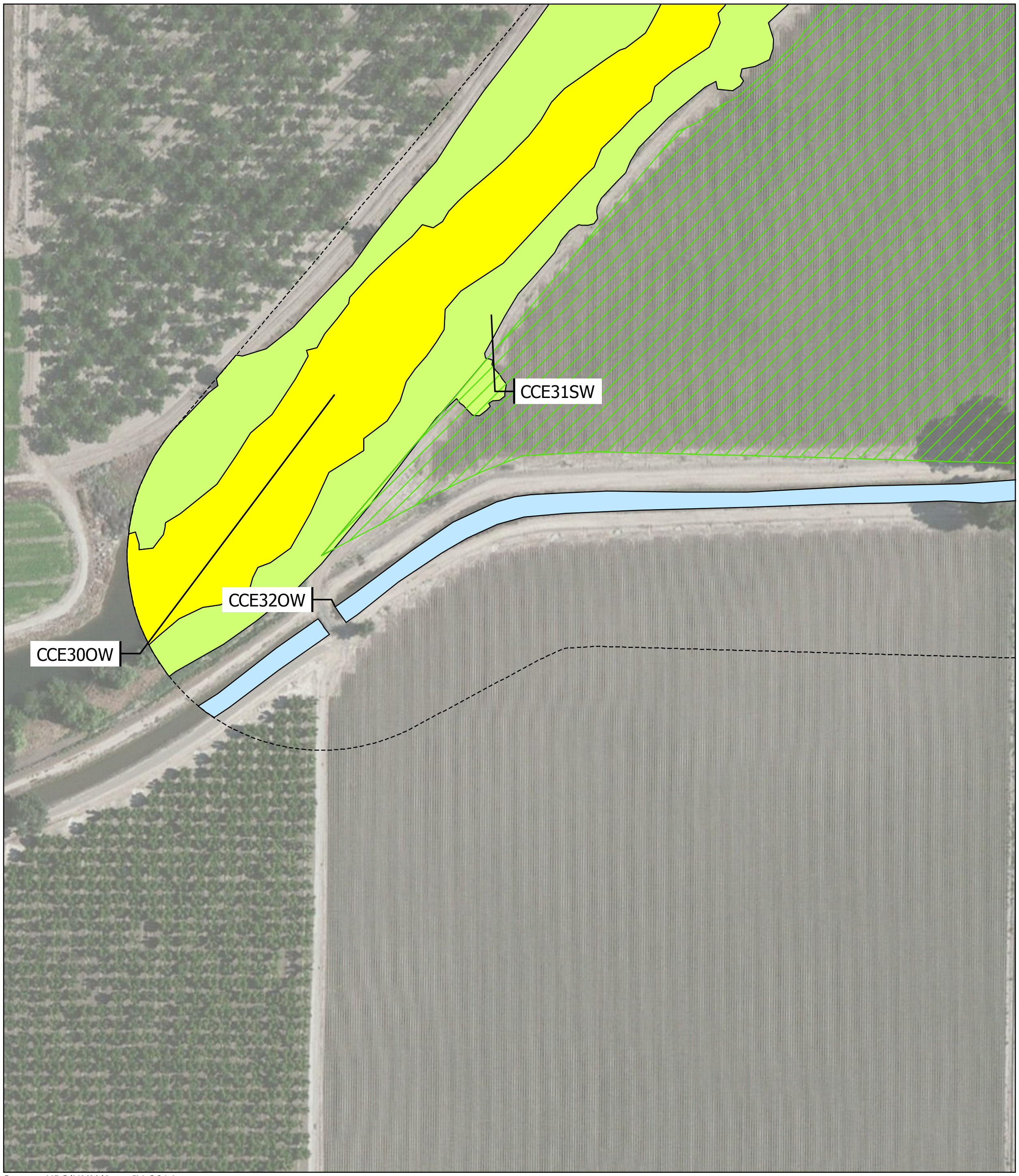
Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales



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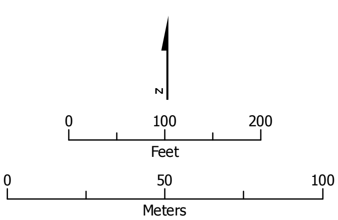

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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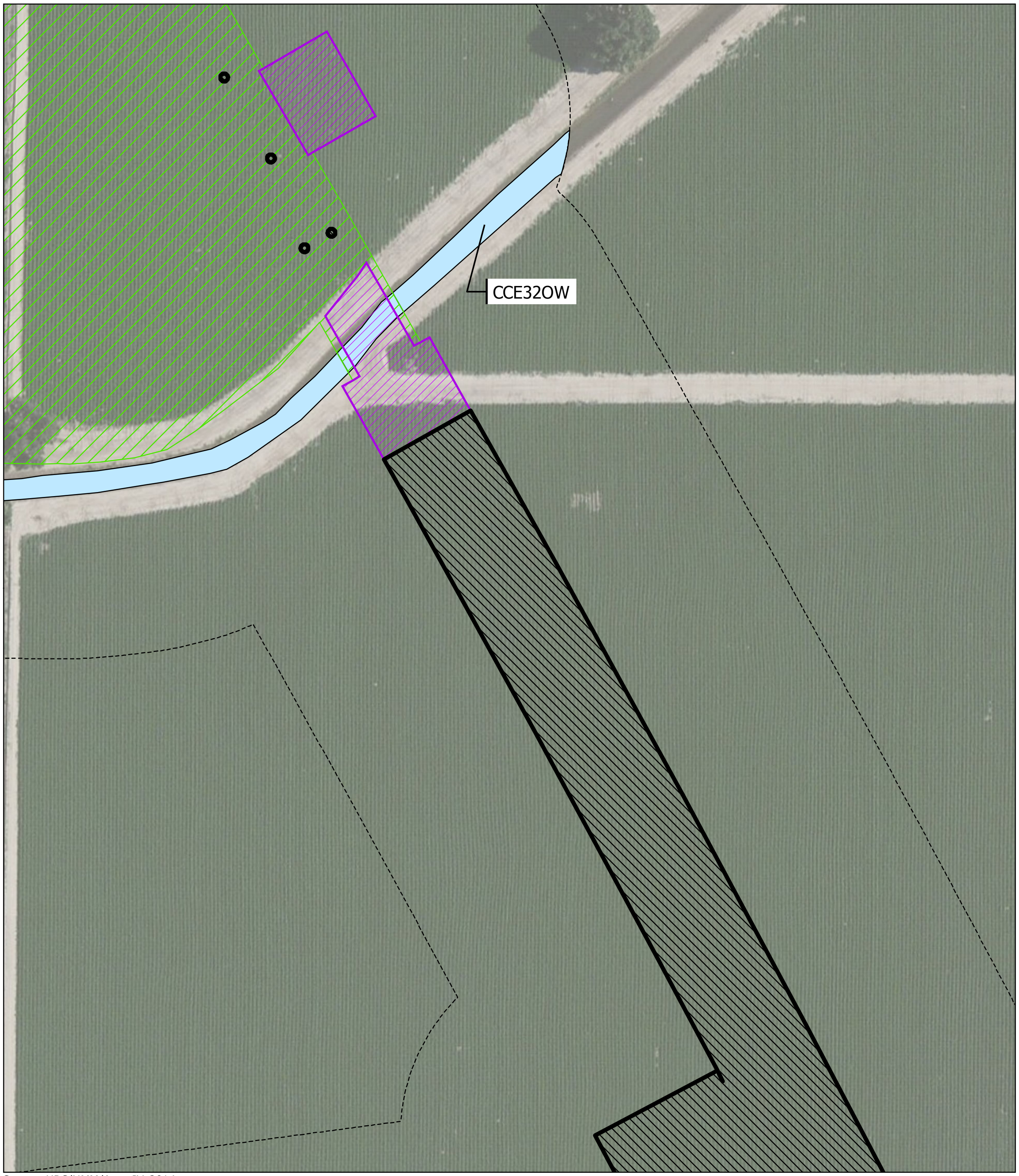

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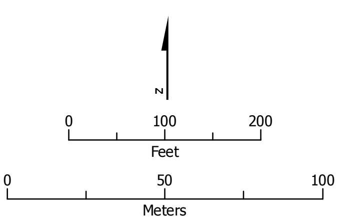

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Project Impact Mapbook

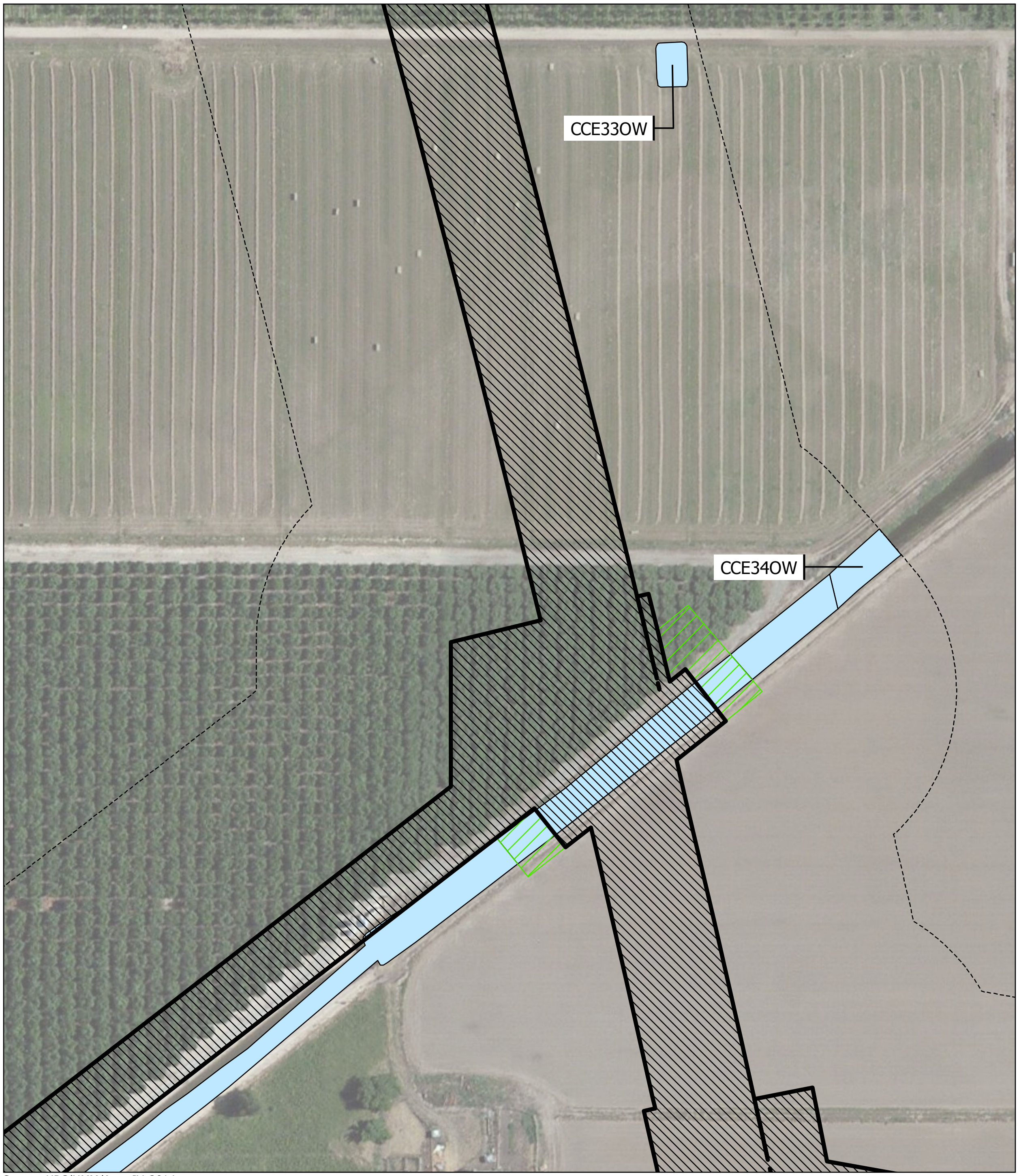

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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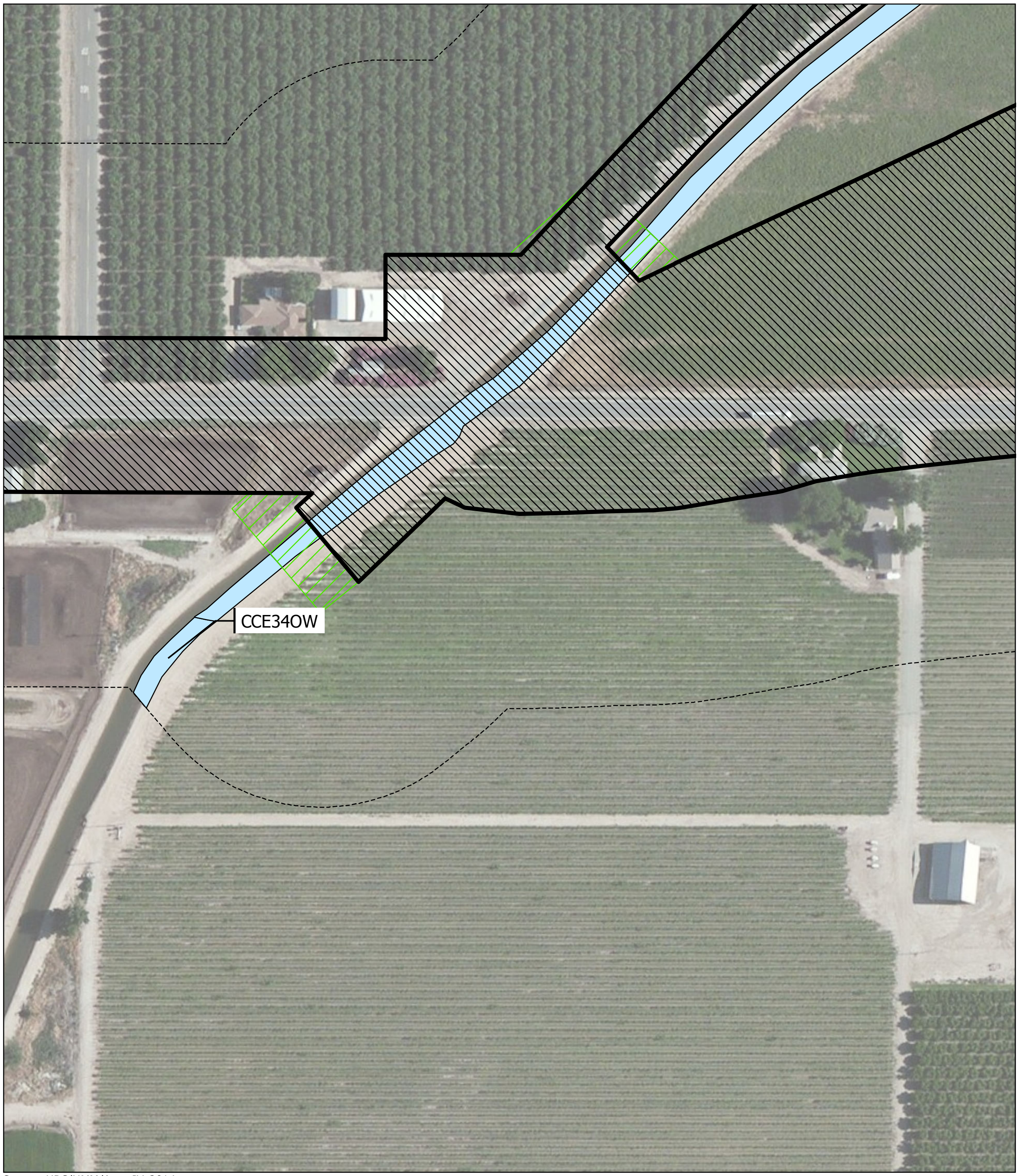

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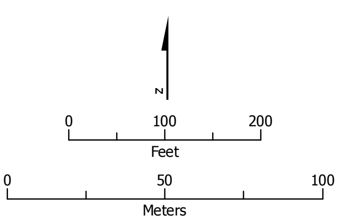

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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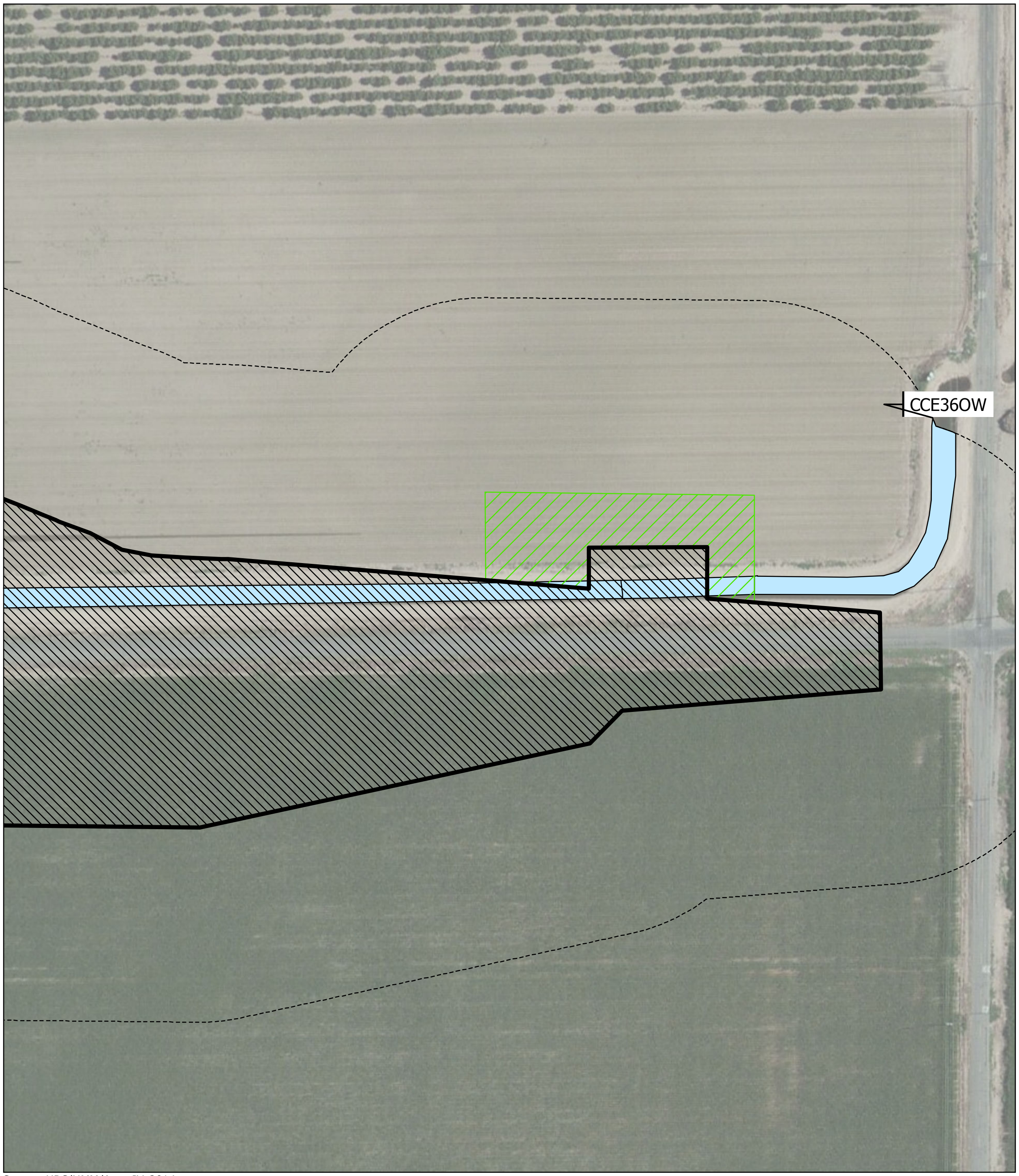

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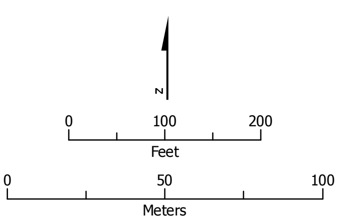

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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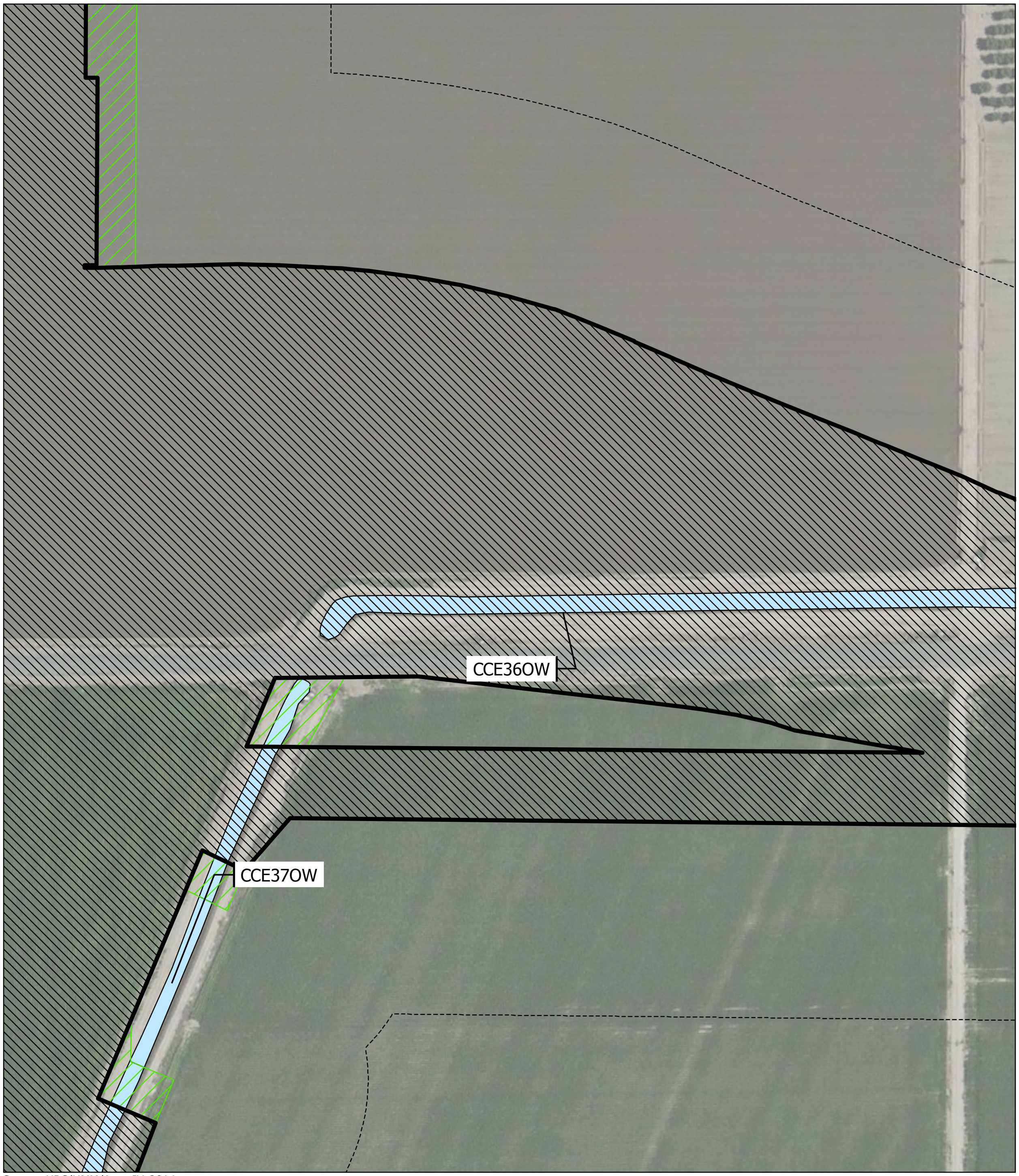
Project Impact Mapbook



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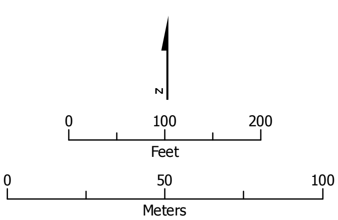

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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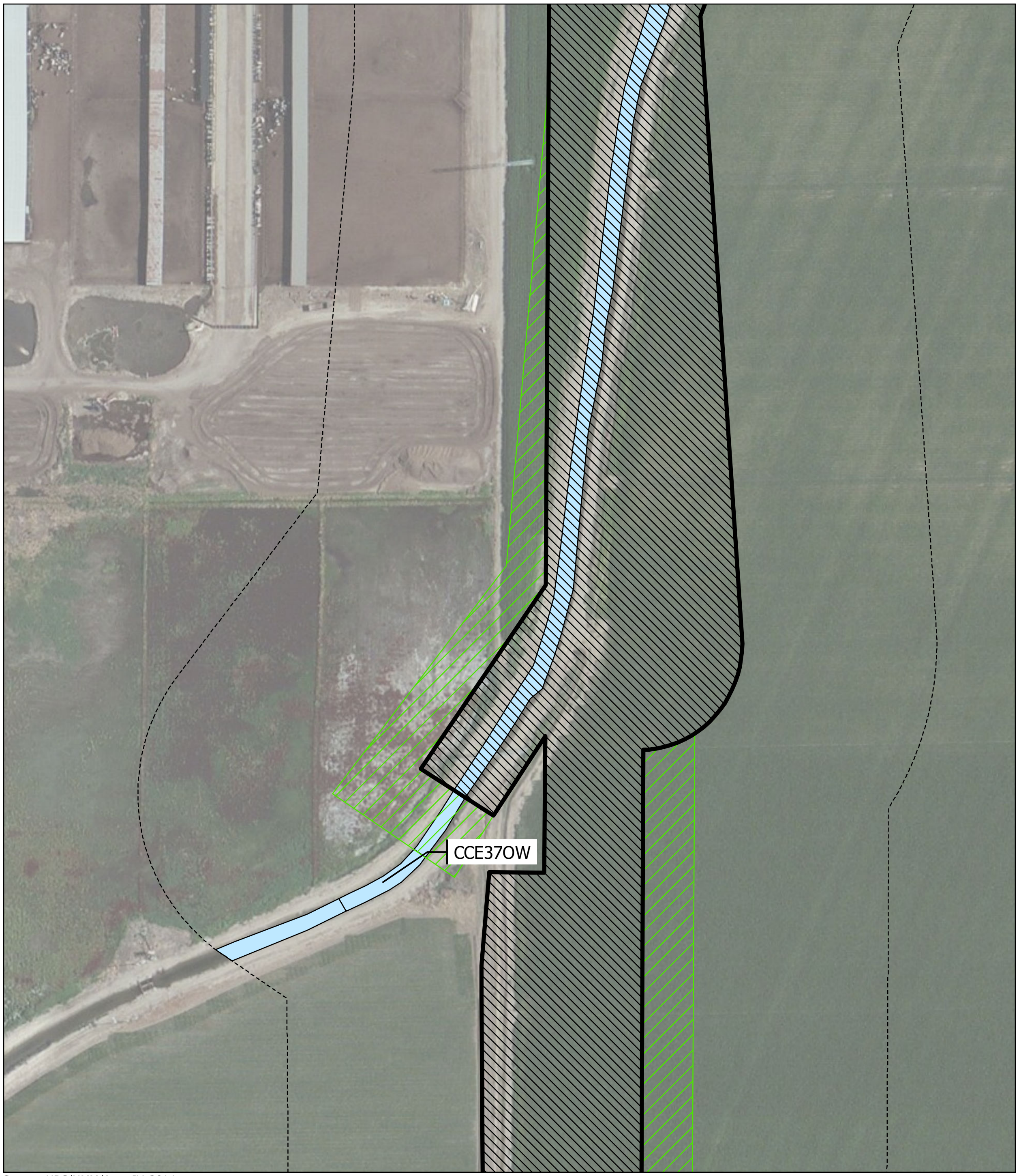

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

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Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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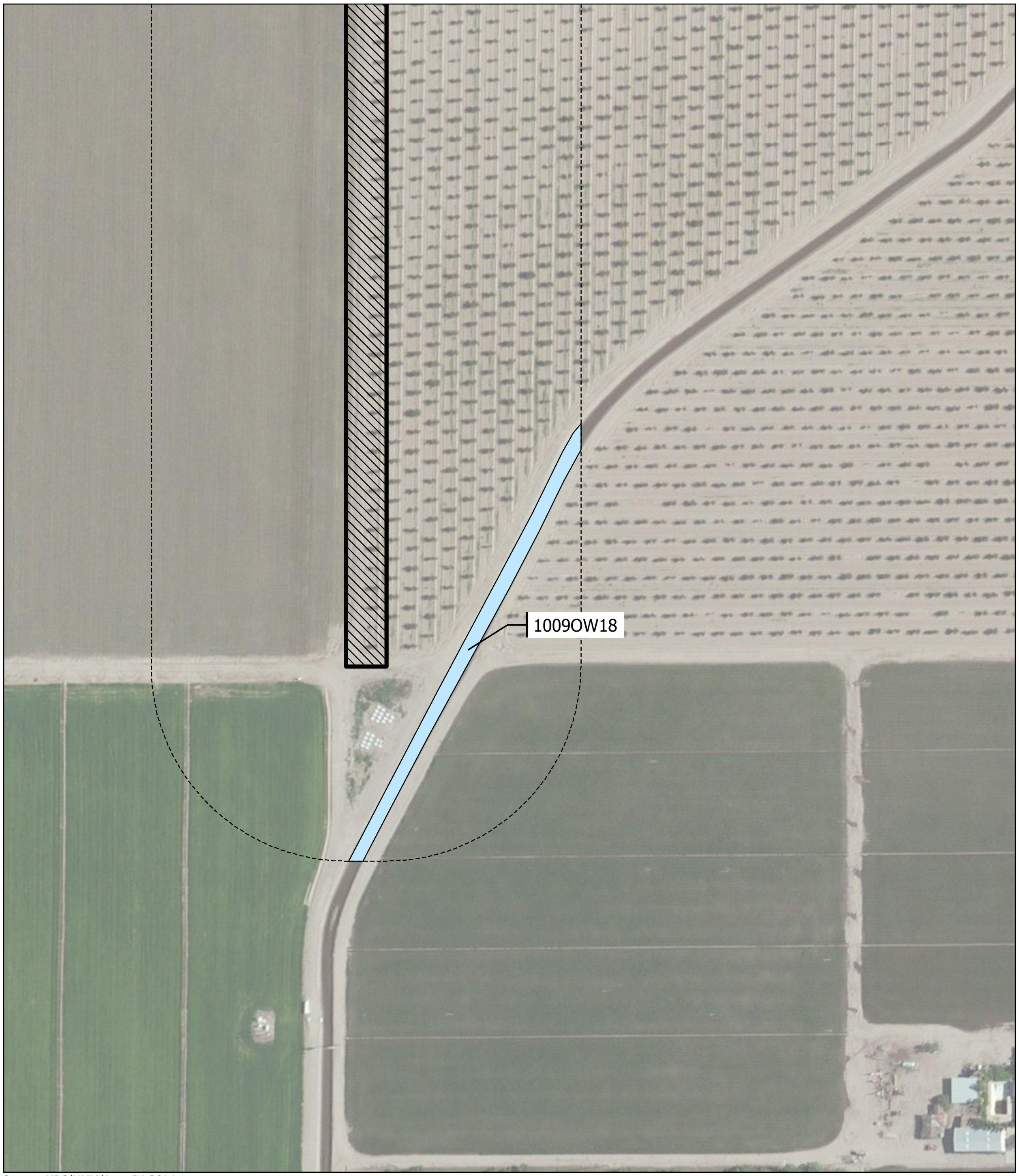
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

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Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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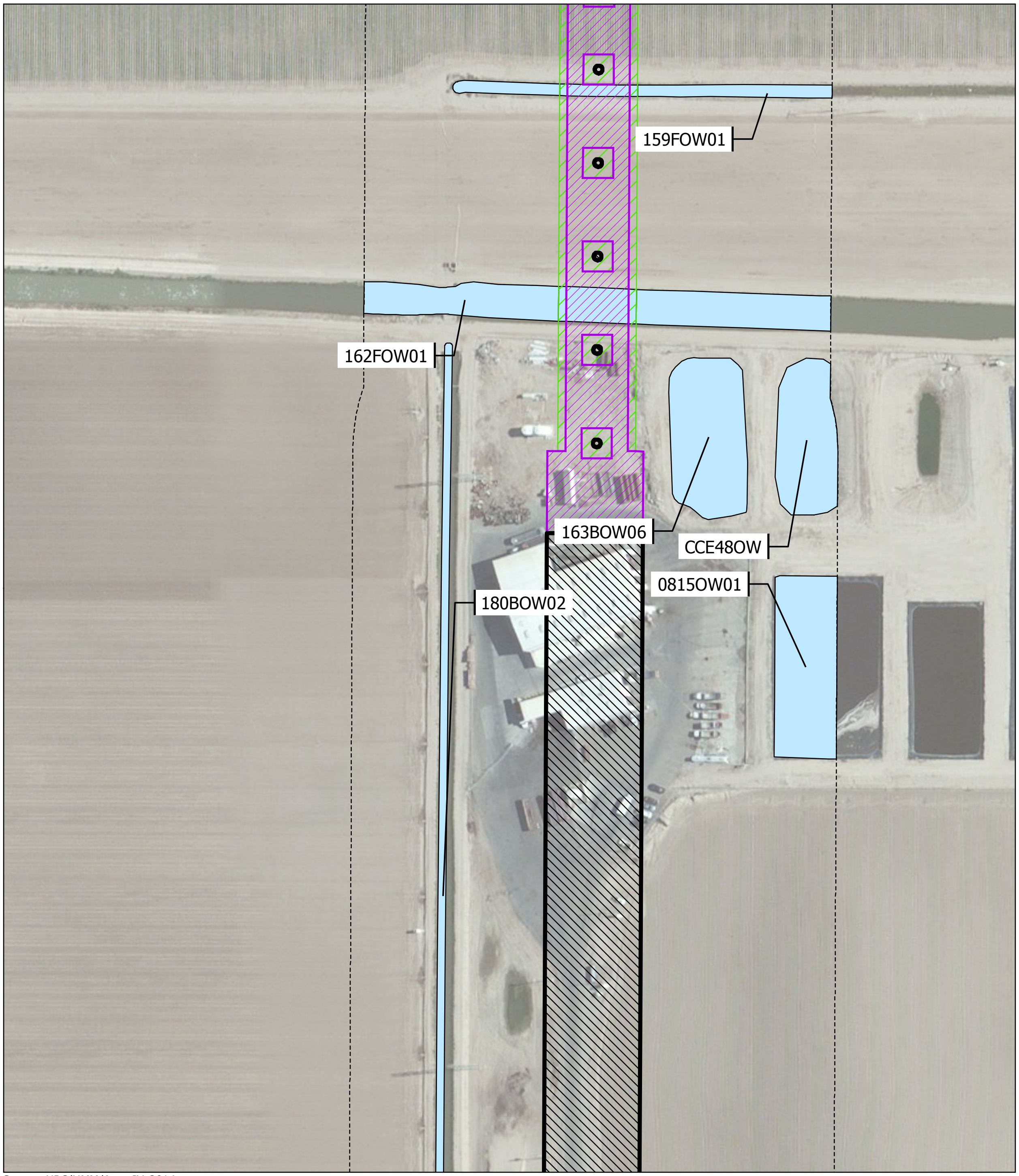

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

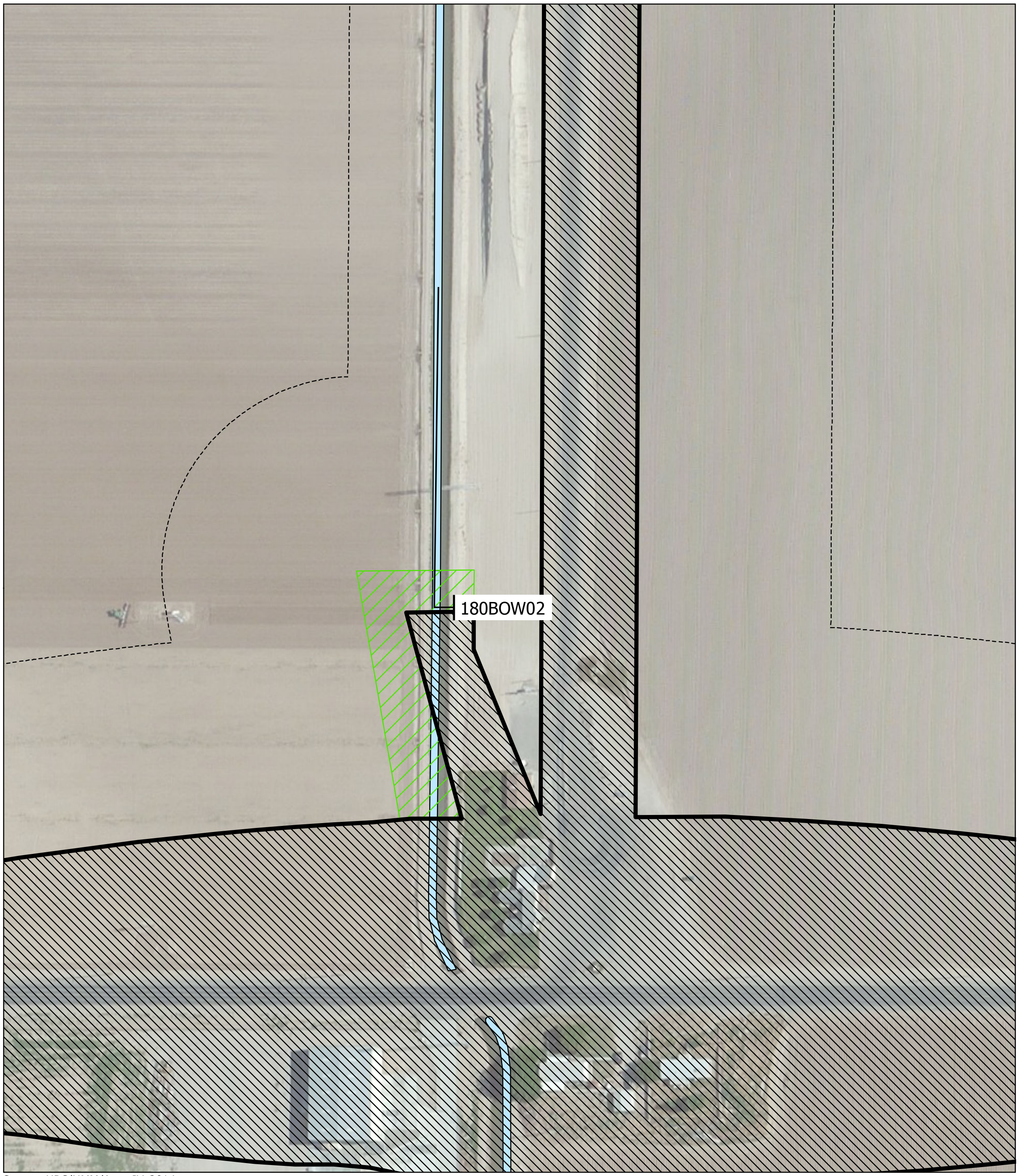
Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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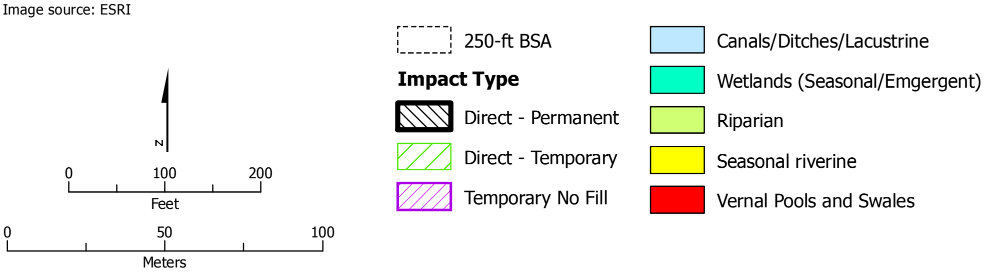

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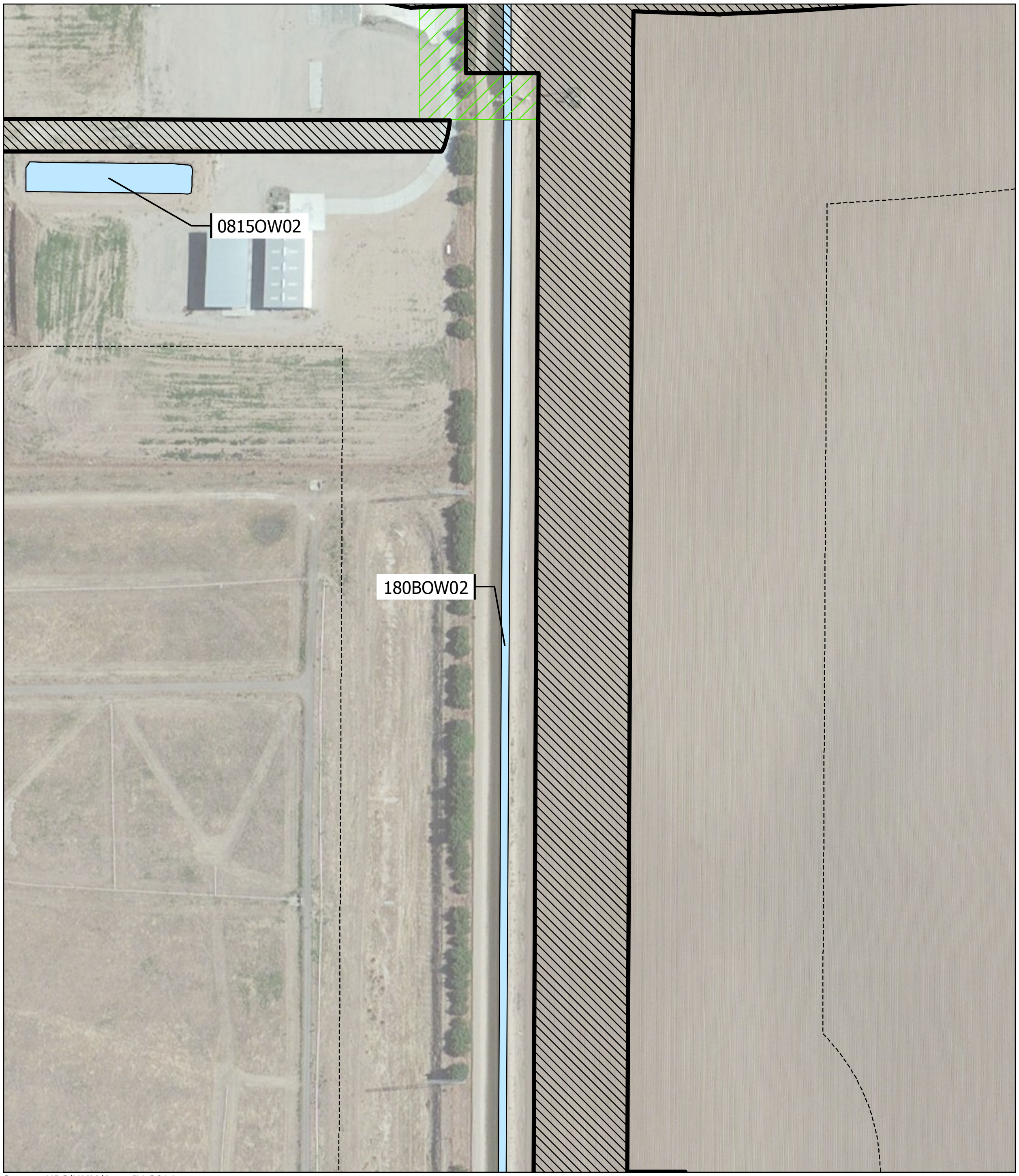
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

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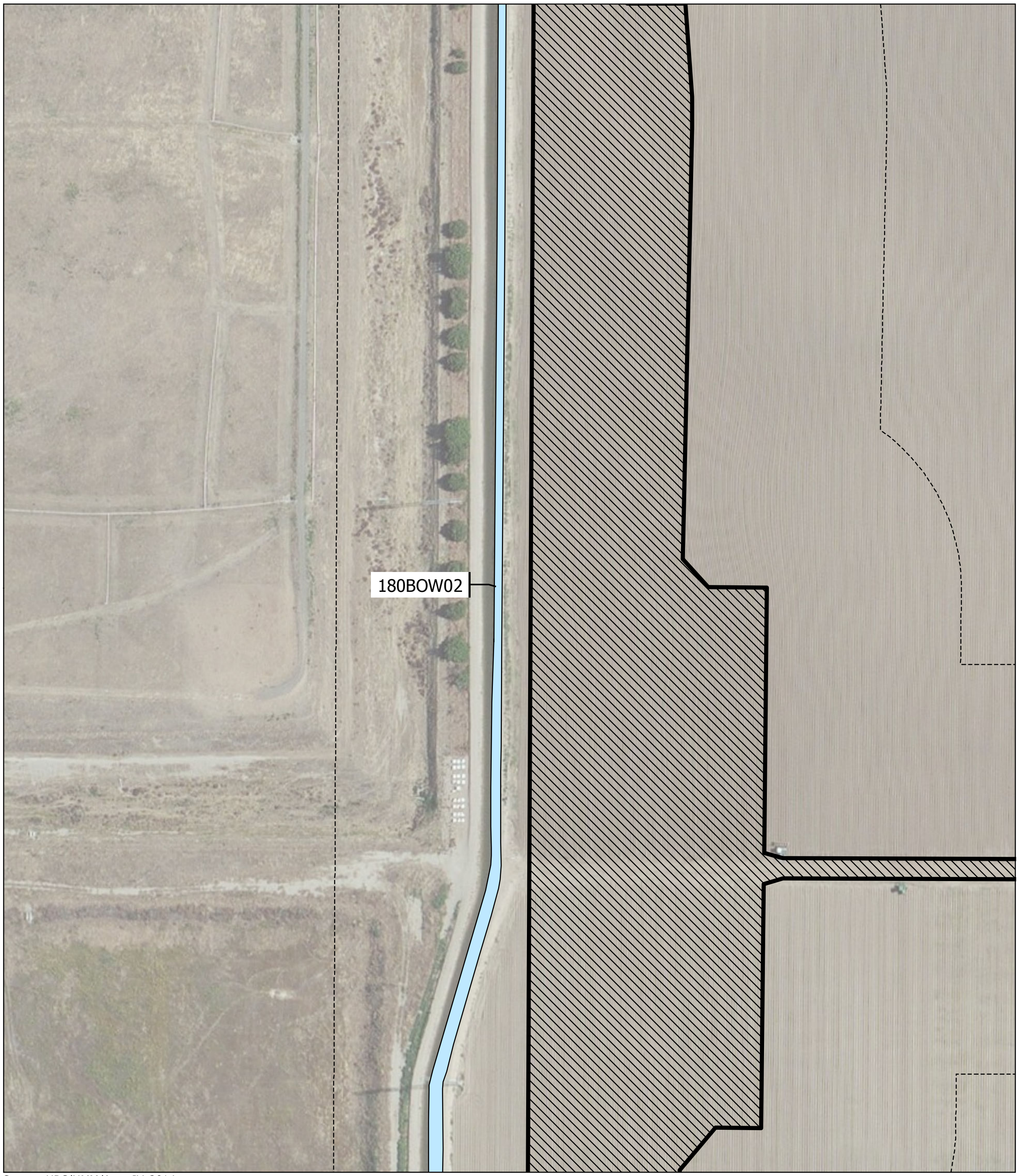

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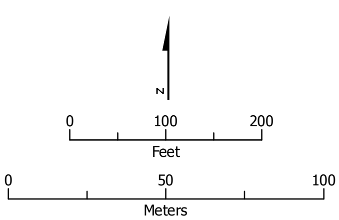
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Project Impact Mapbook
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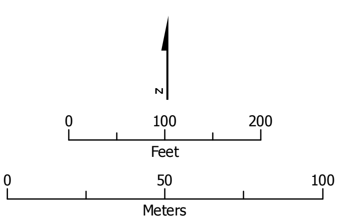
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
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Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

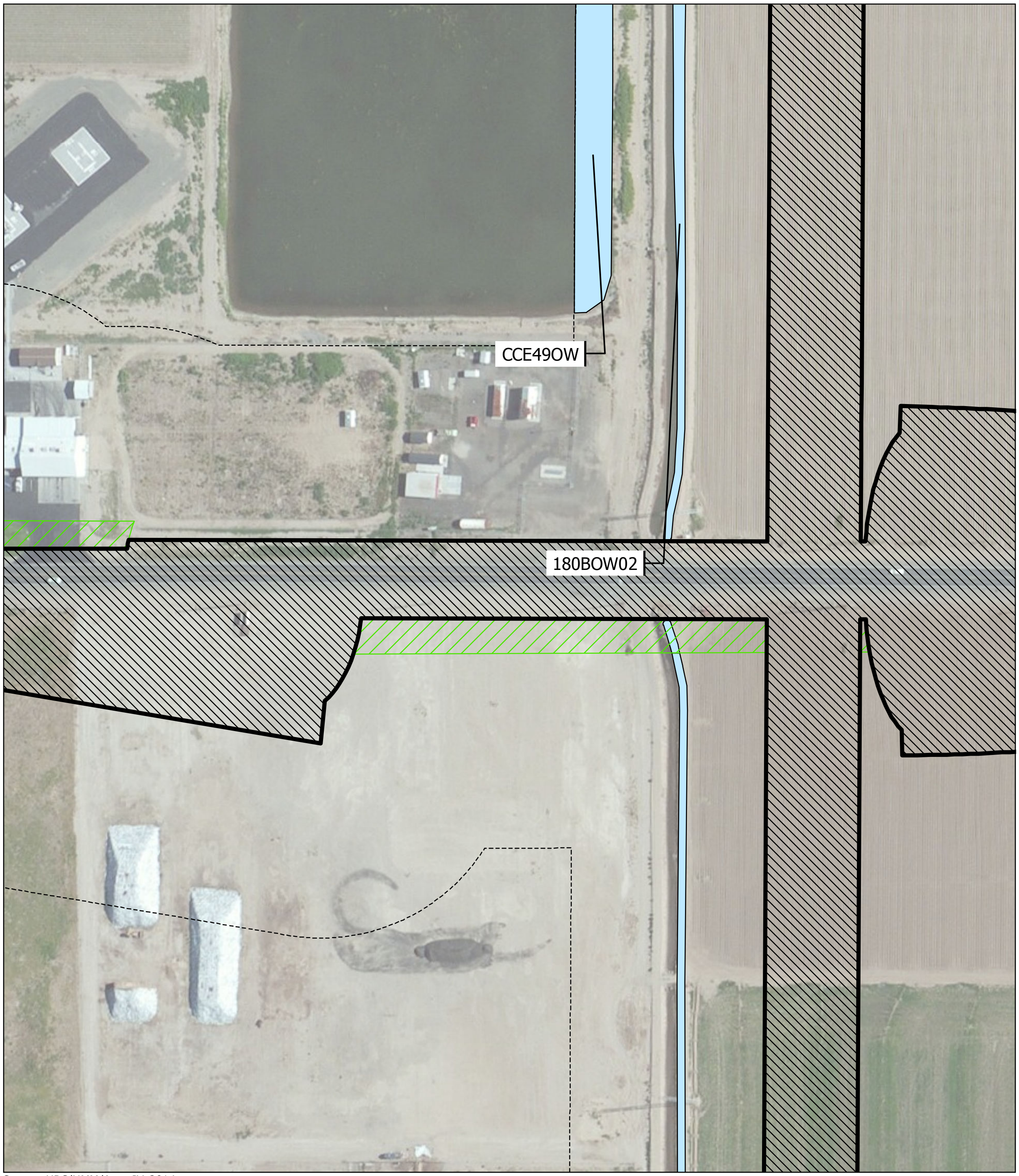

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
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Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

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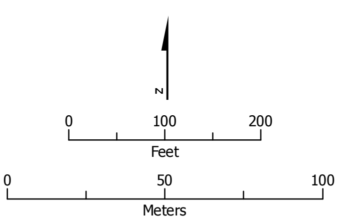

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

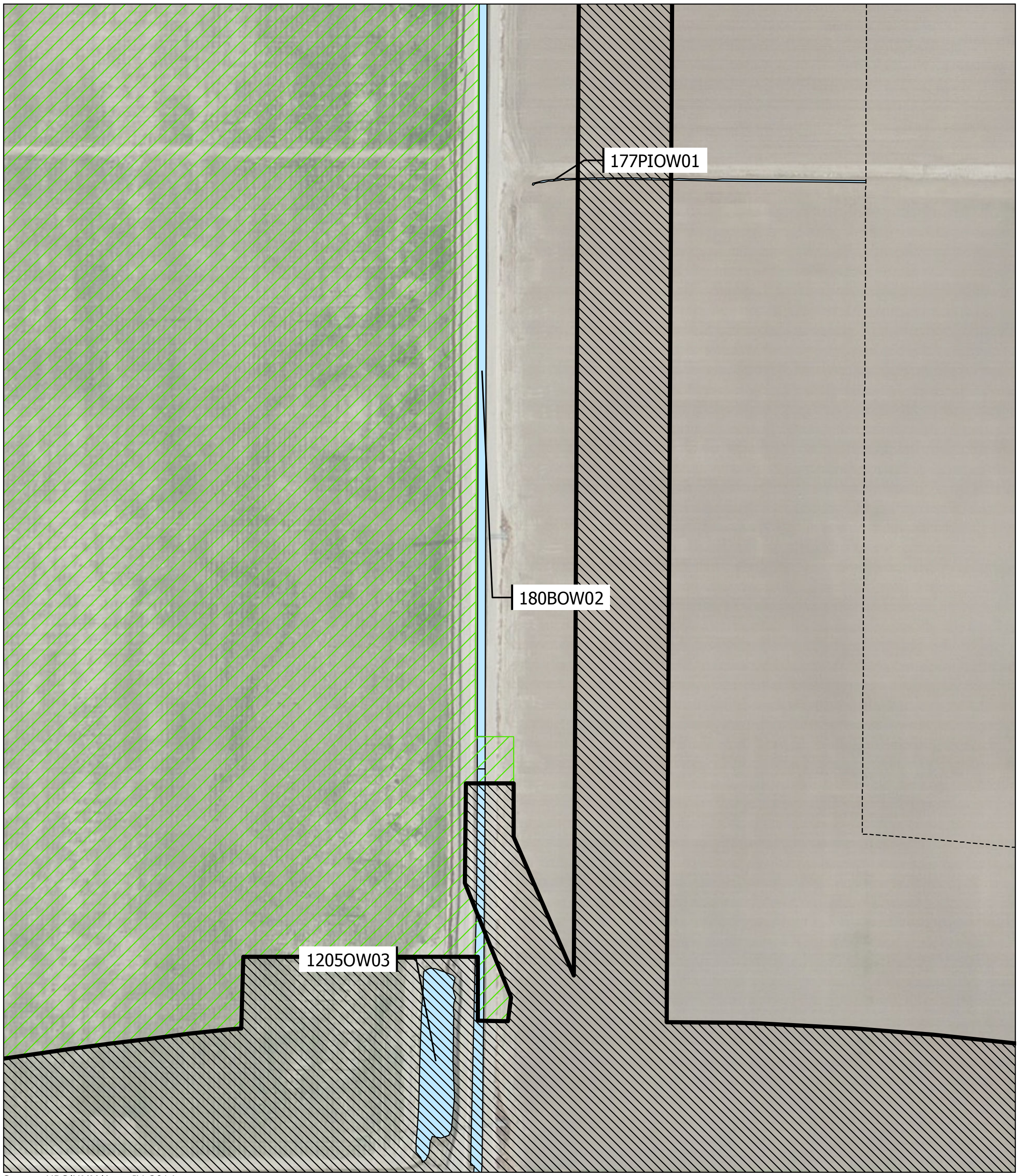

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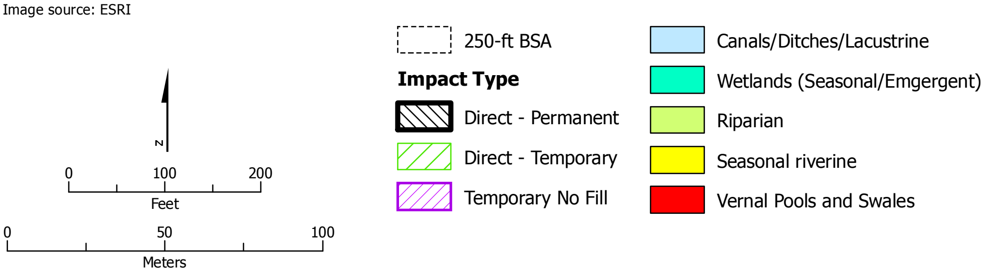
Image source: ESRI

January 22, 2014



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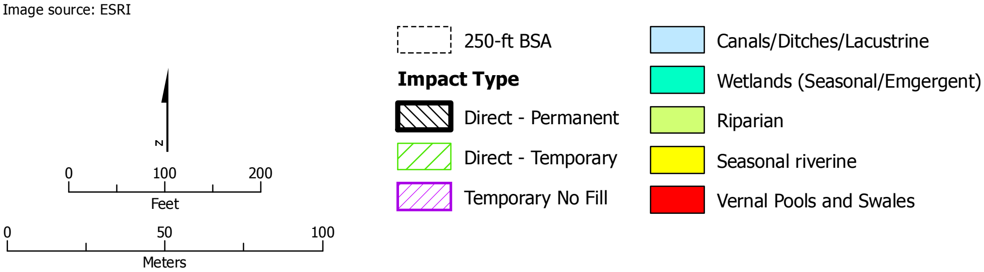
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

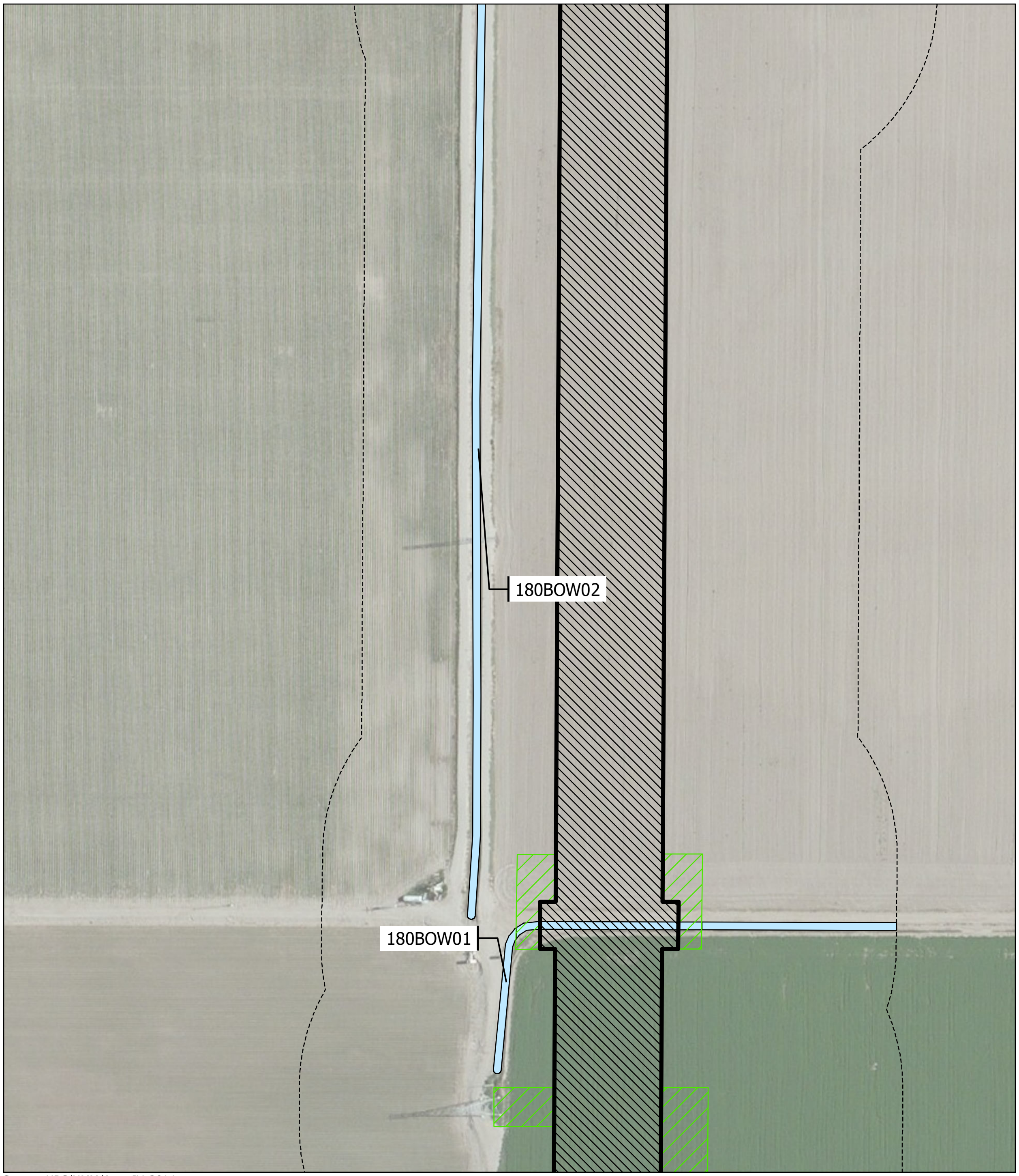


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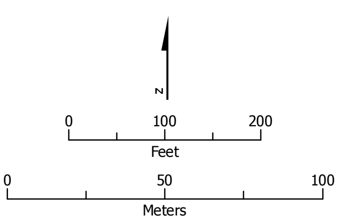
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

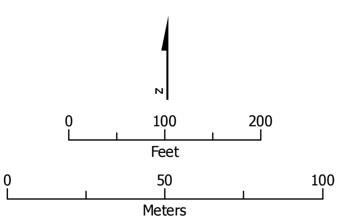
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

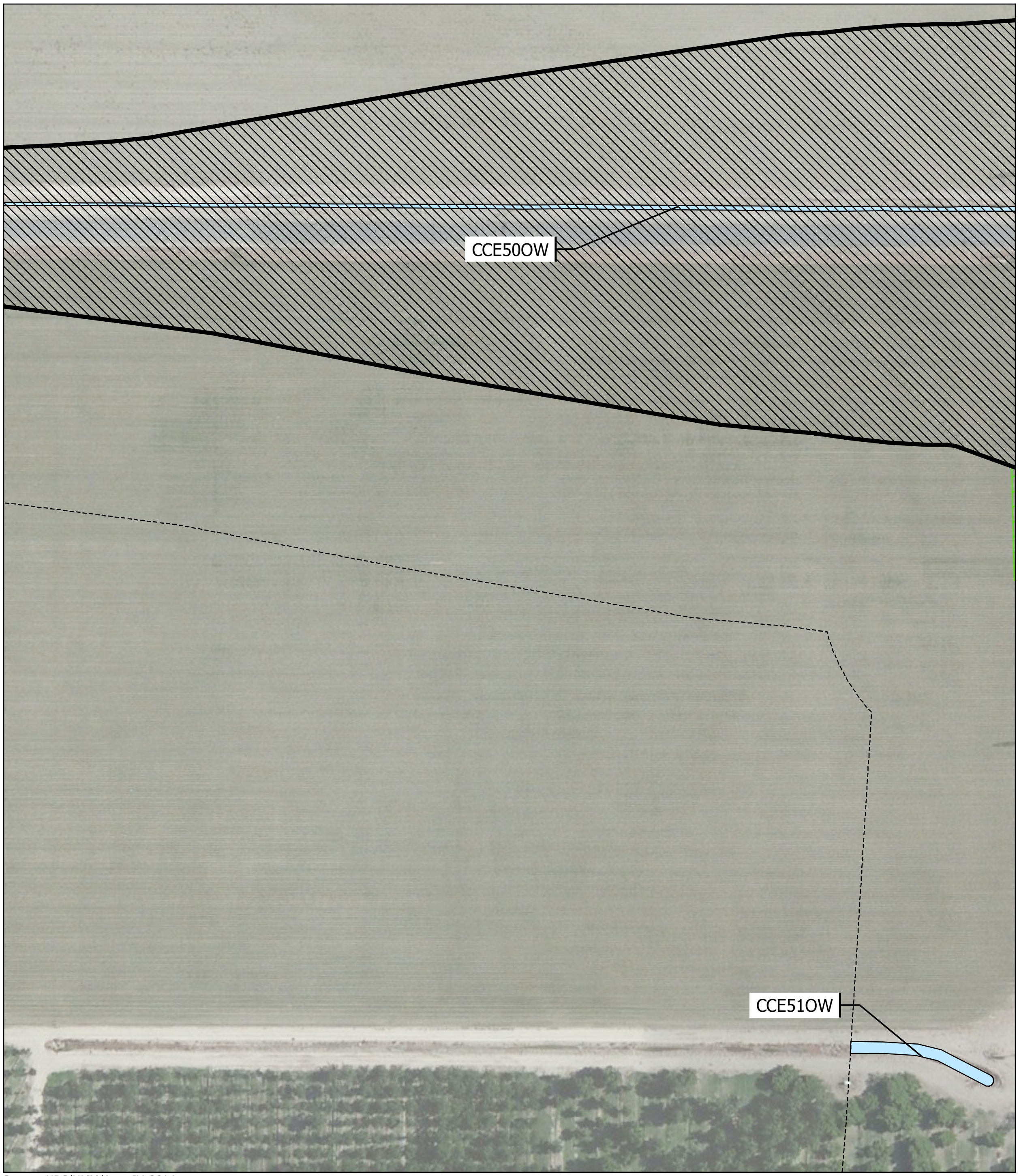


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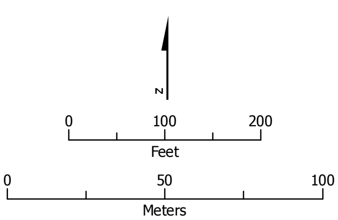
Image source: ESRI

January 22, 2014



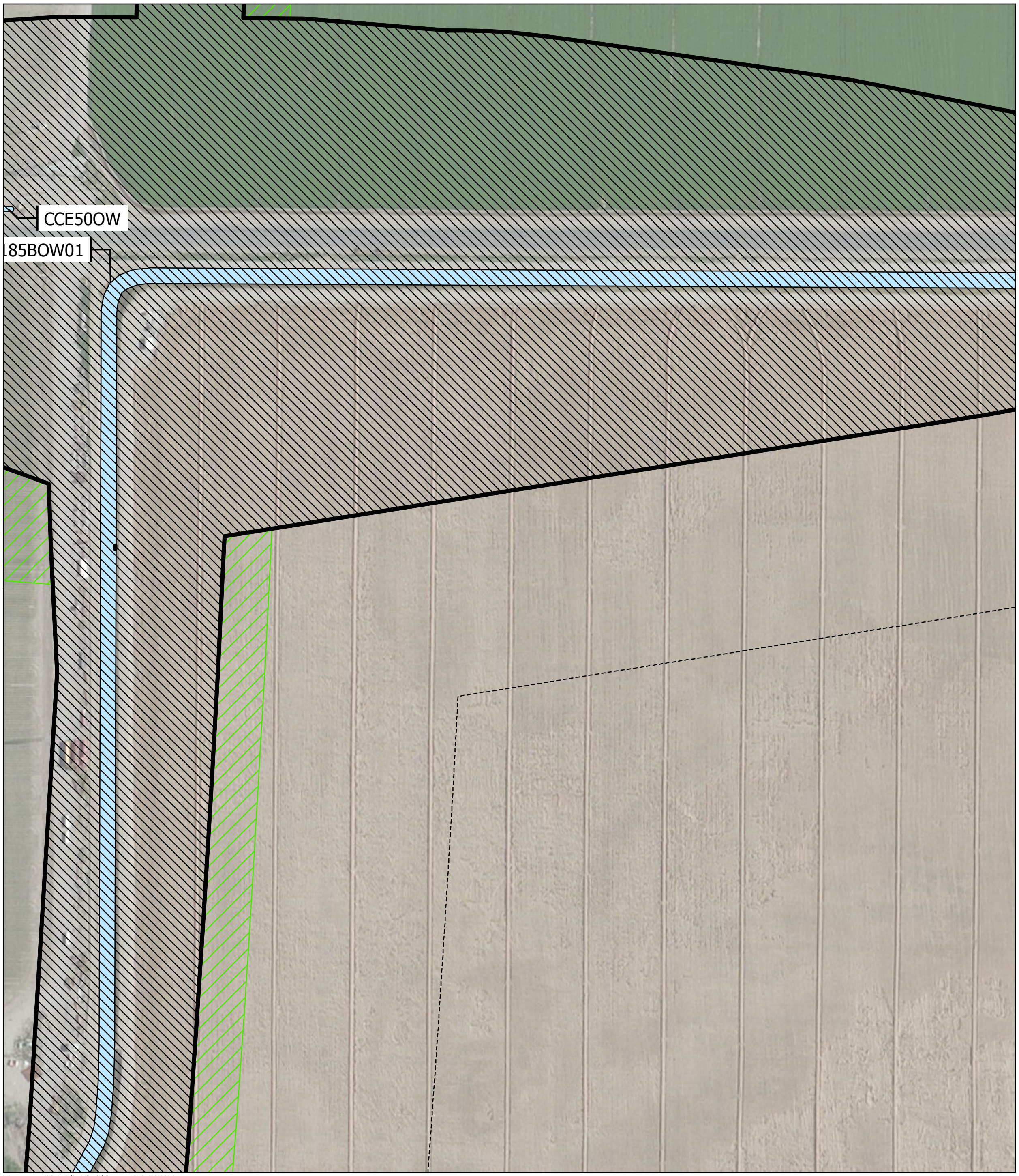
250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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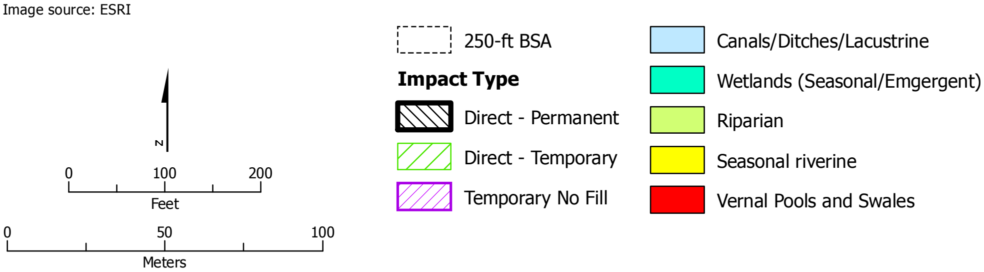

Appendix 4
Project Impact Mapbook

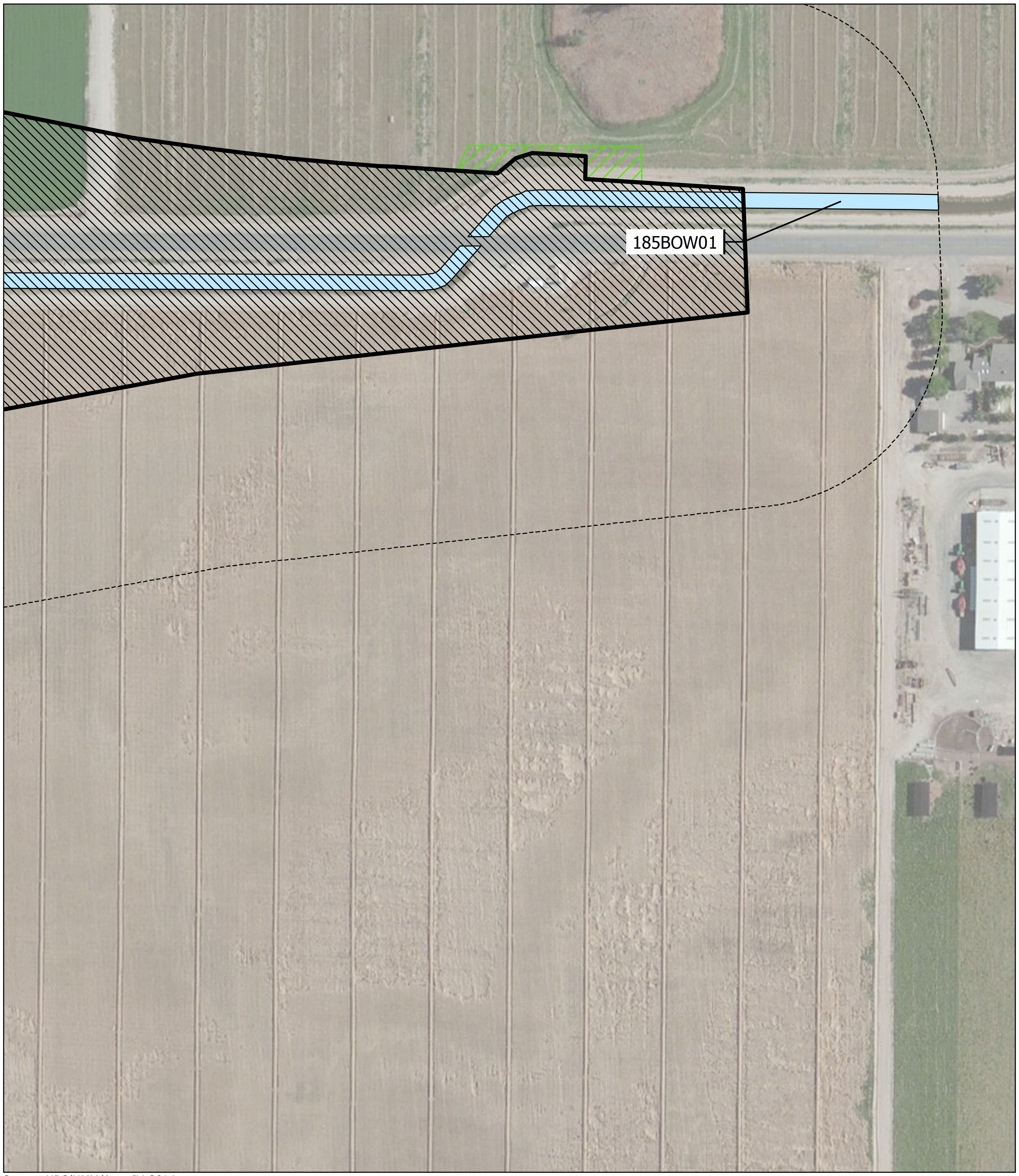

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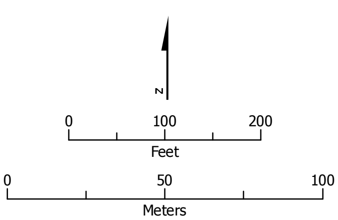
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

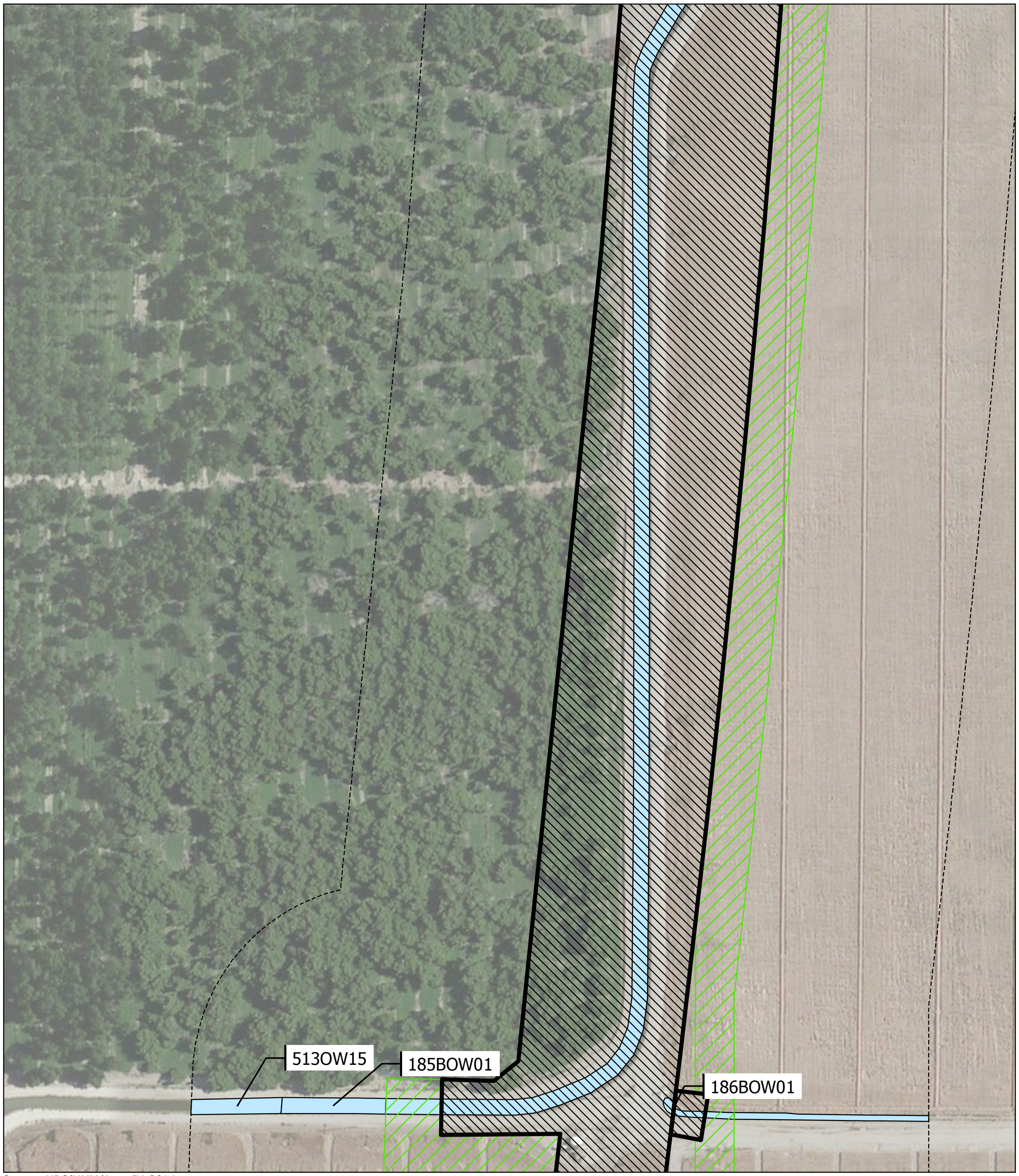


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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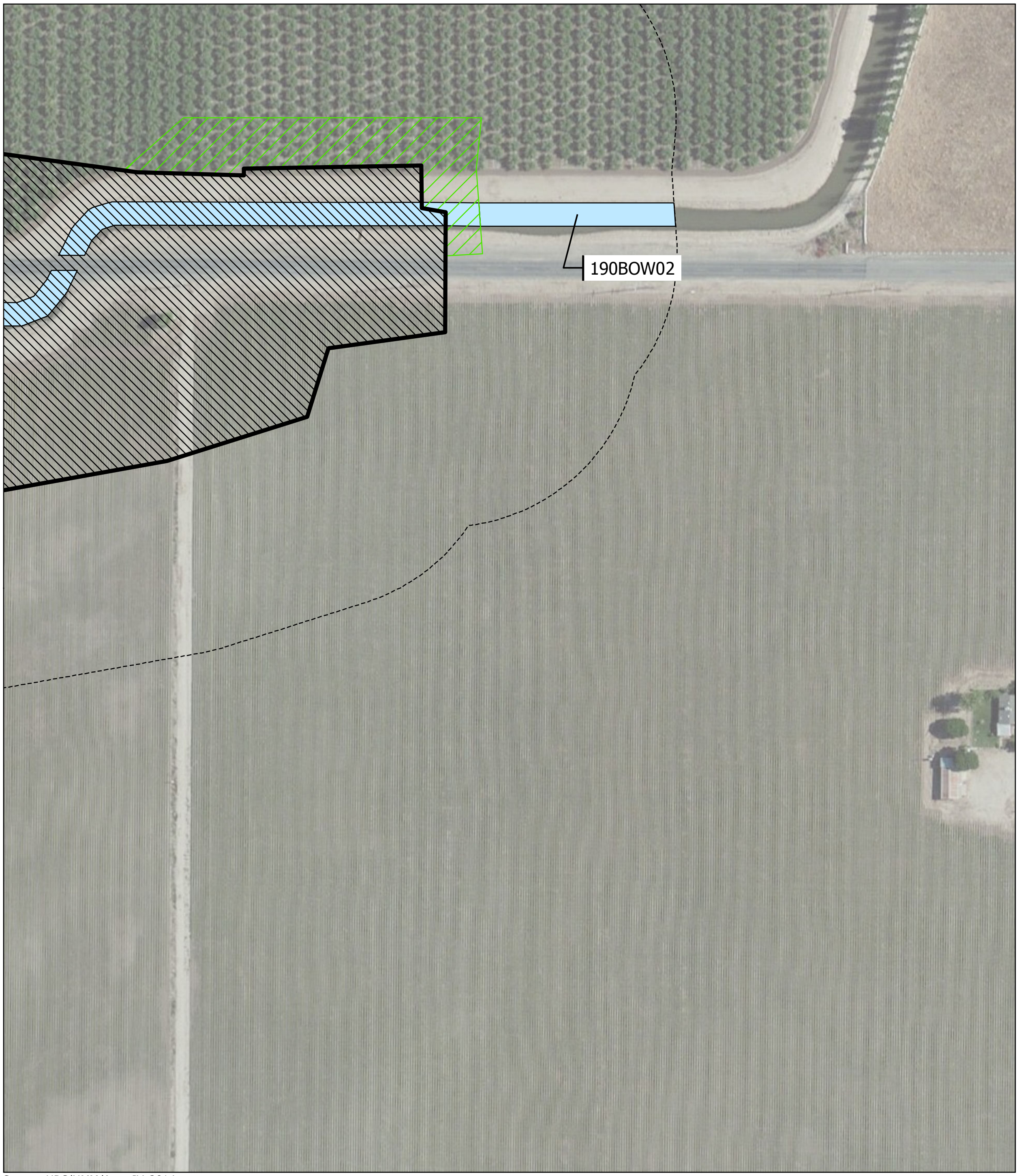

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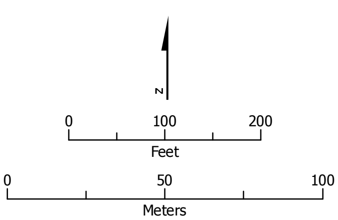

250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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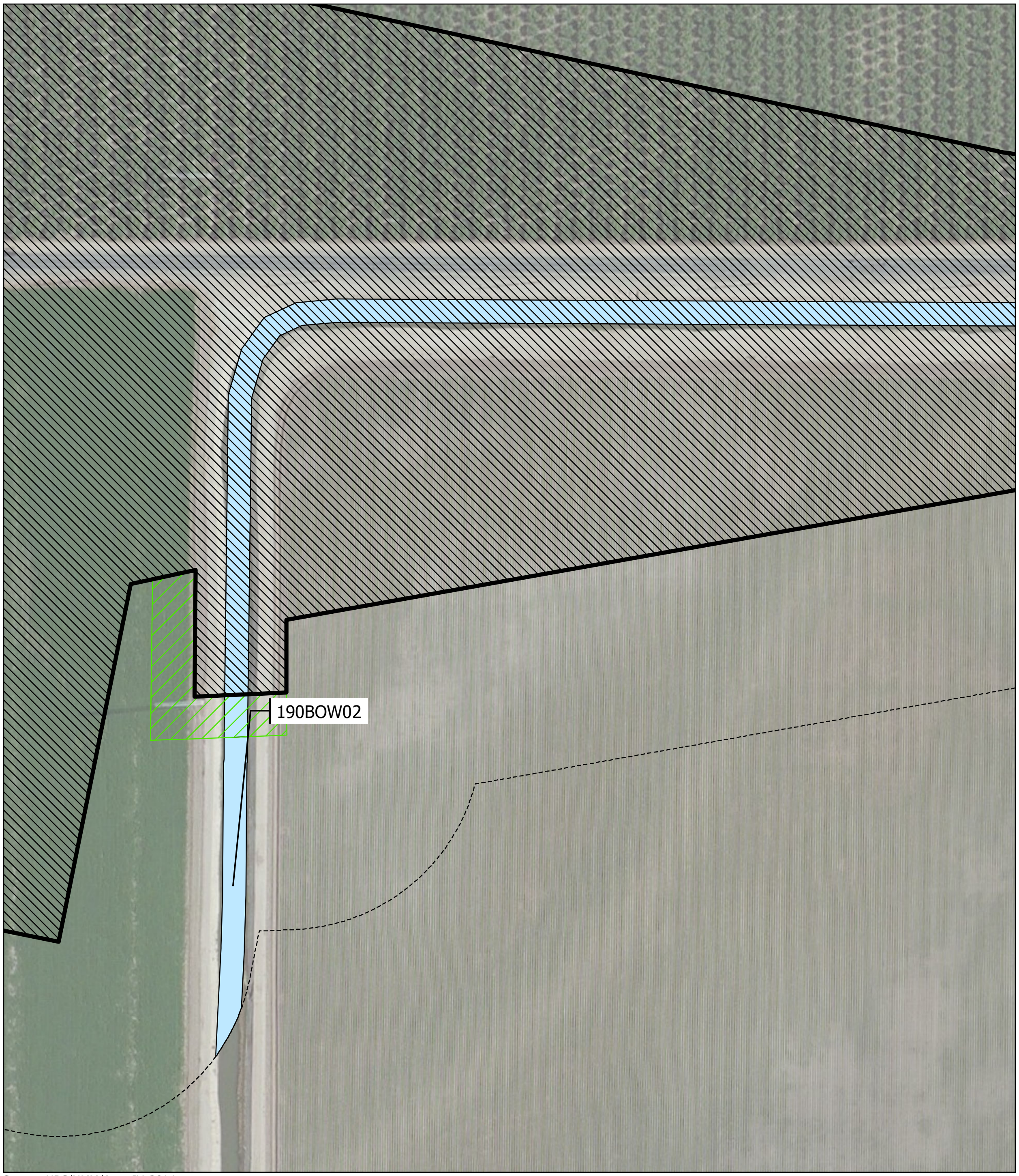

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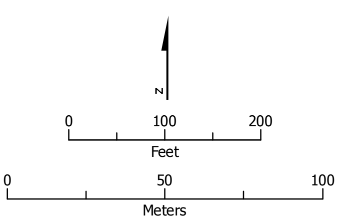

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

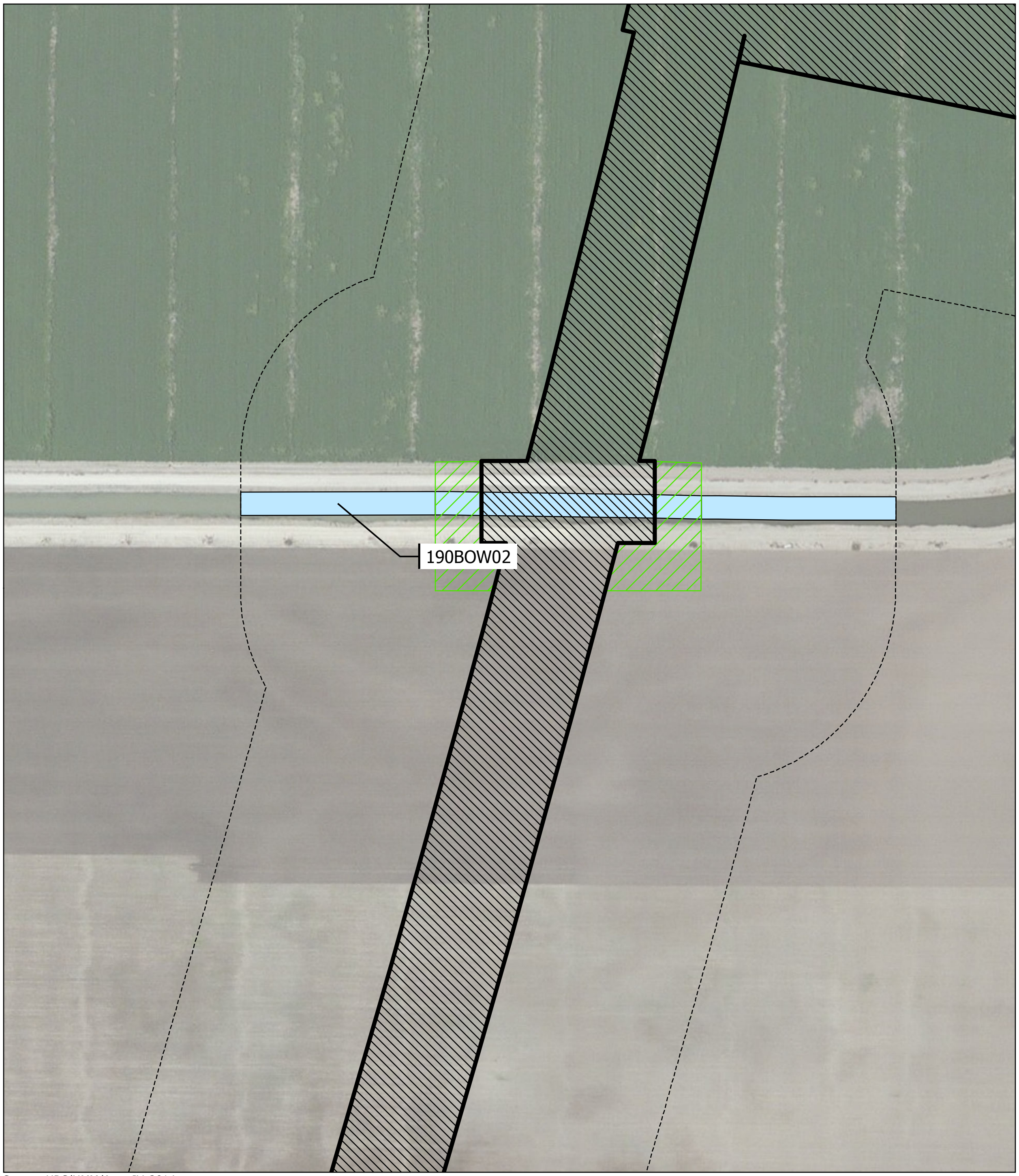

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

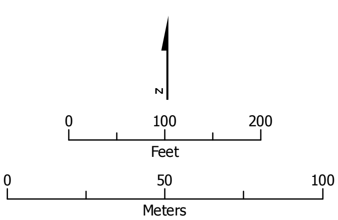

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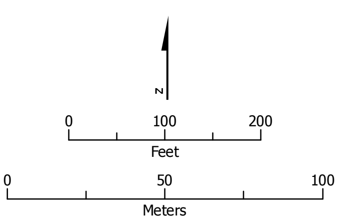
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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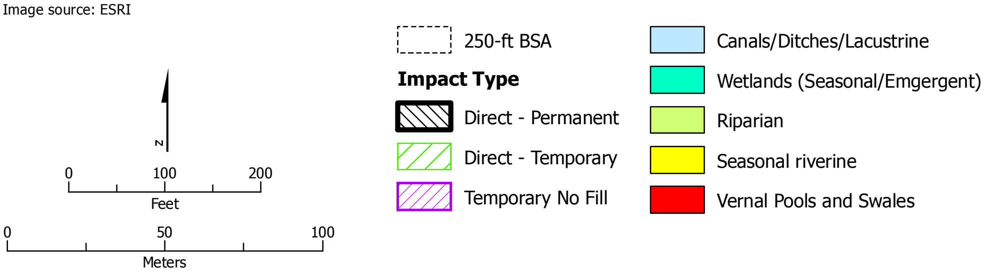
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



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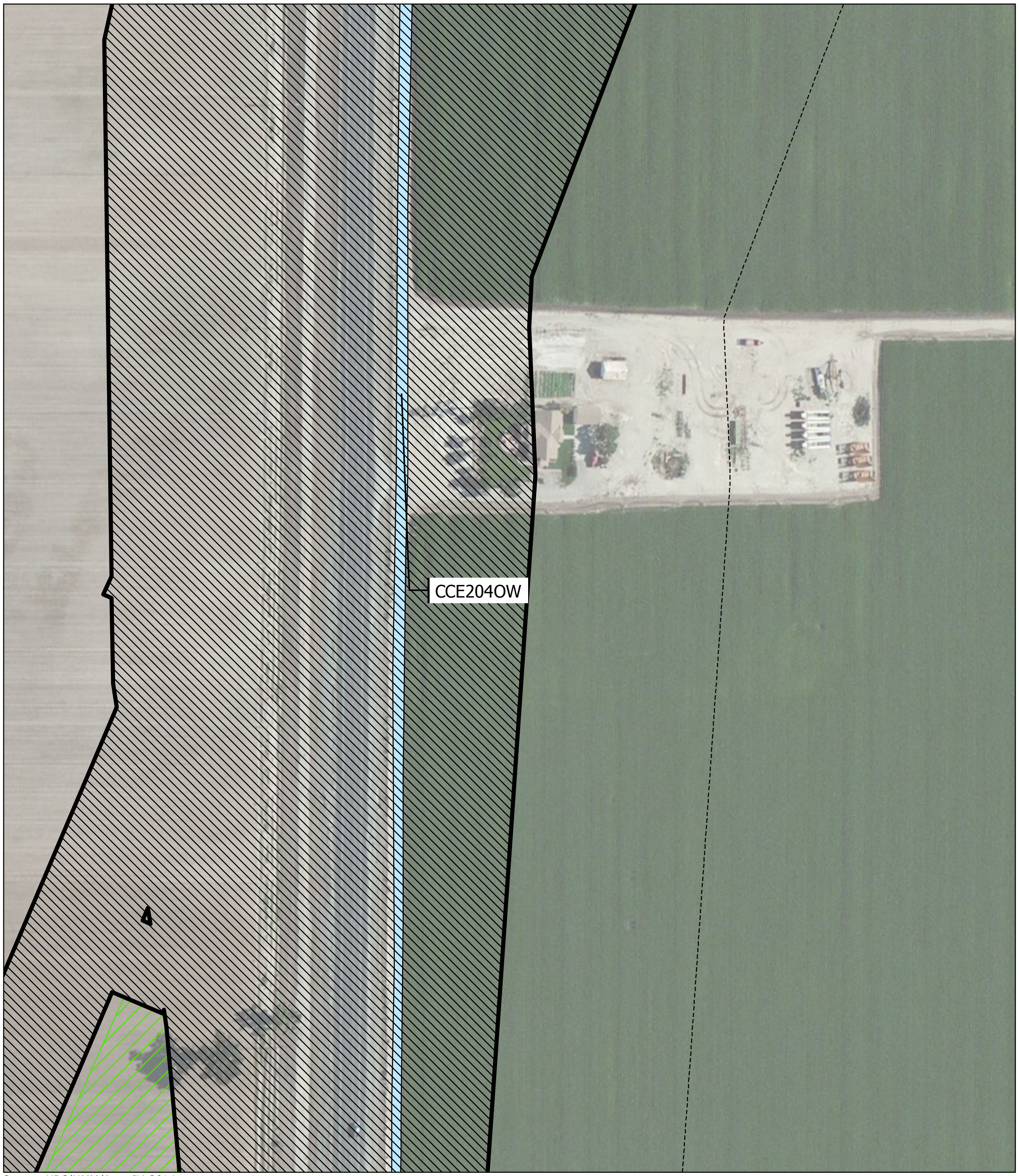

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Image source: ESRI

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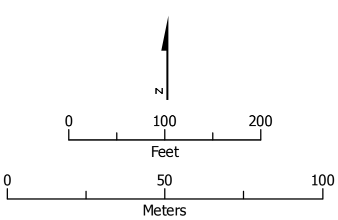

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

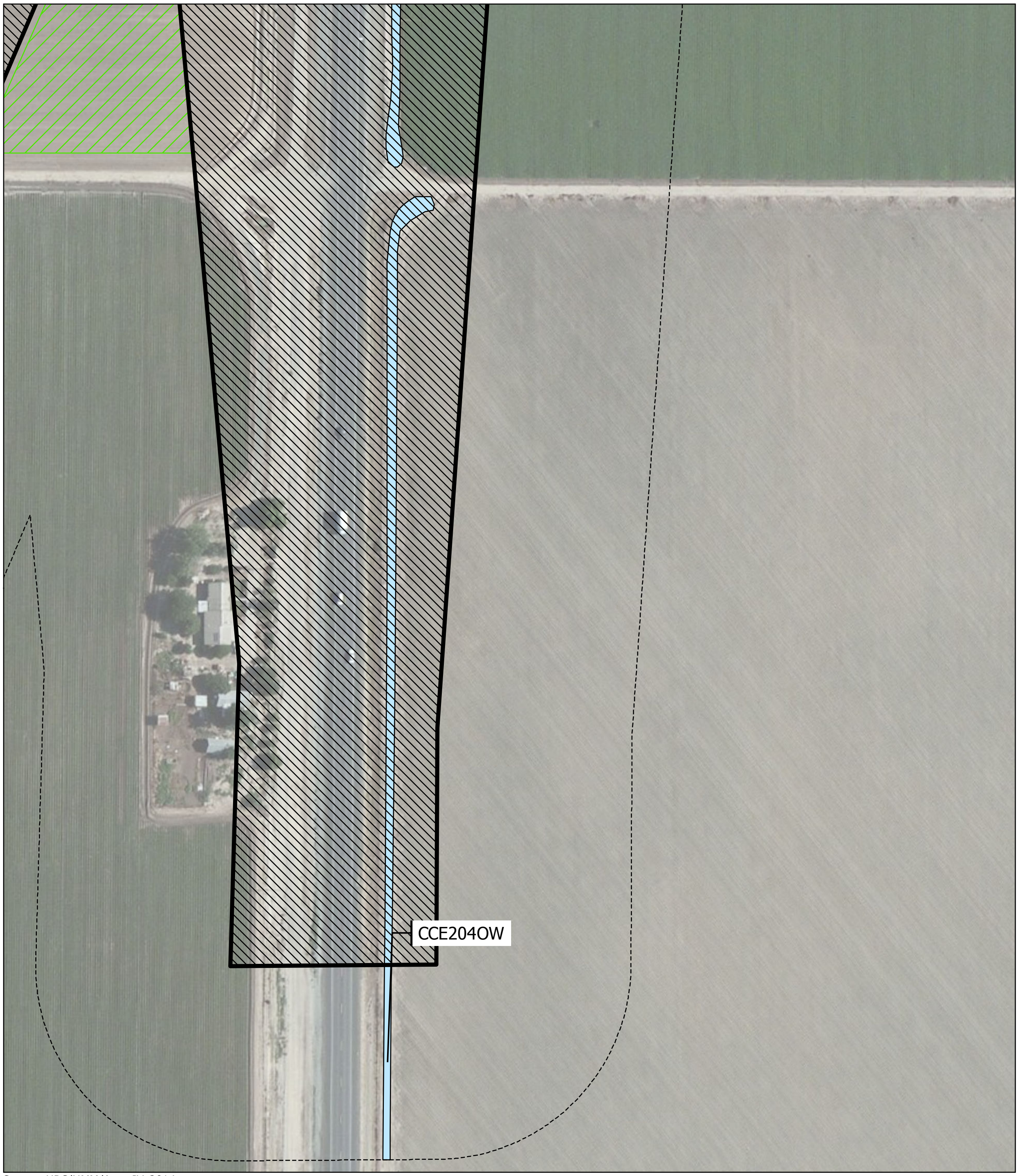

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

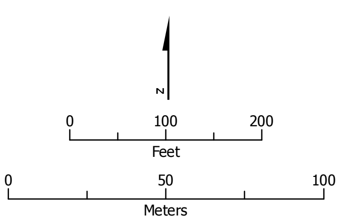
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

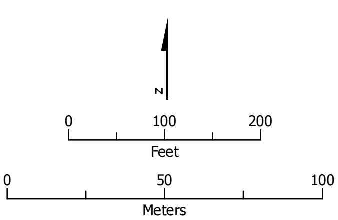
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

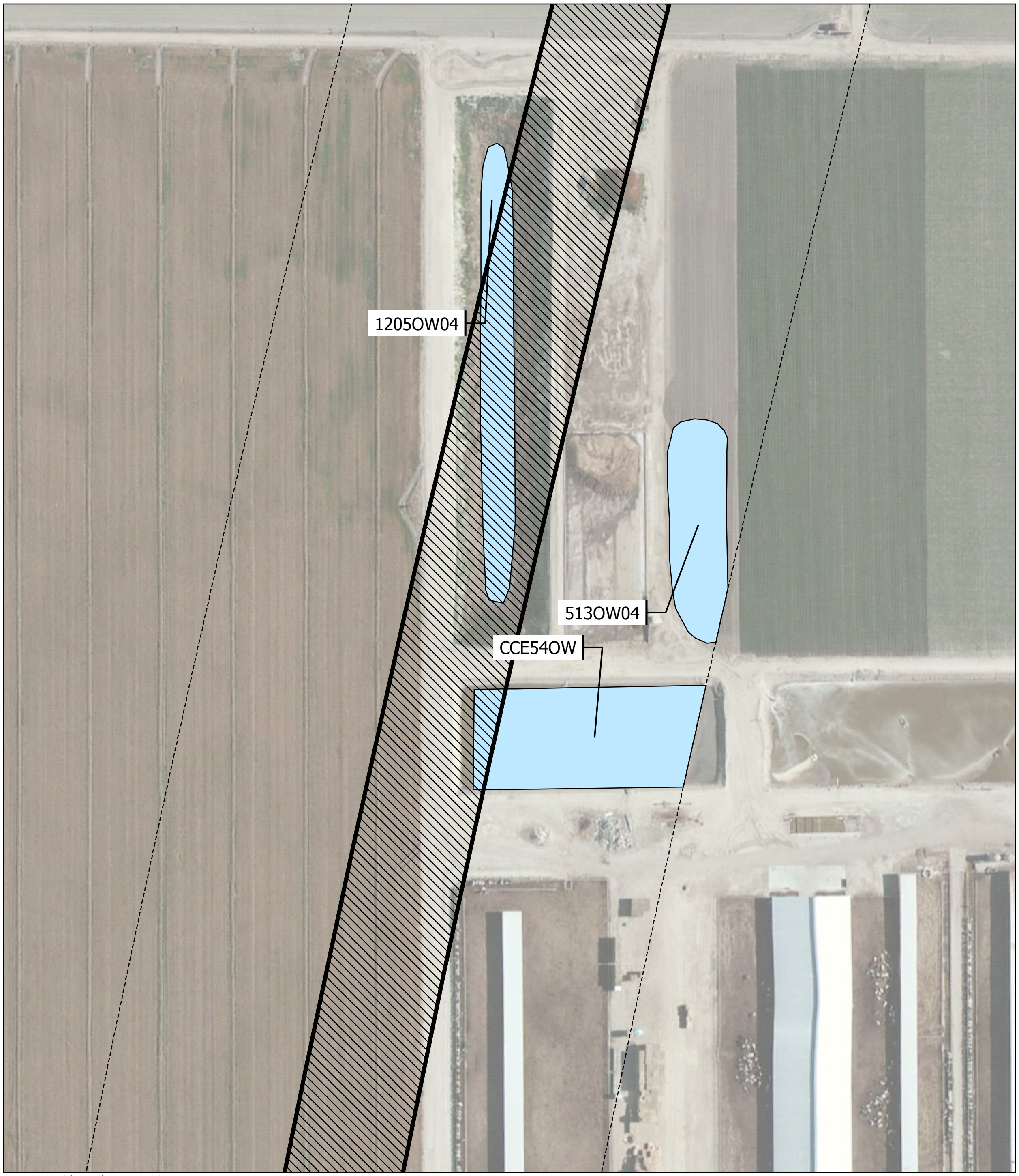


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

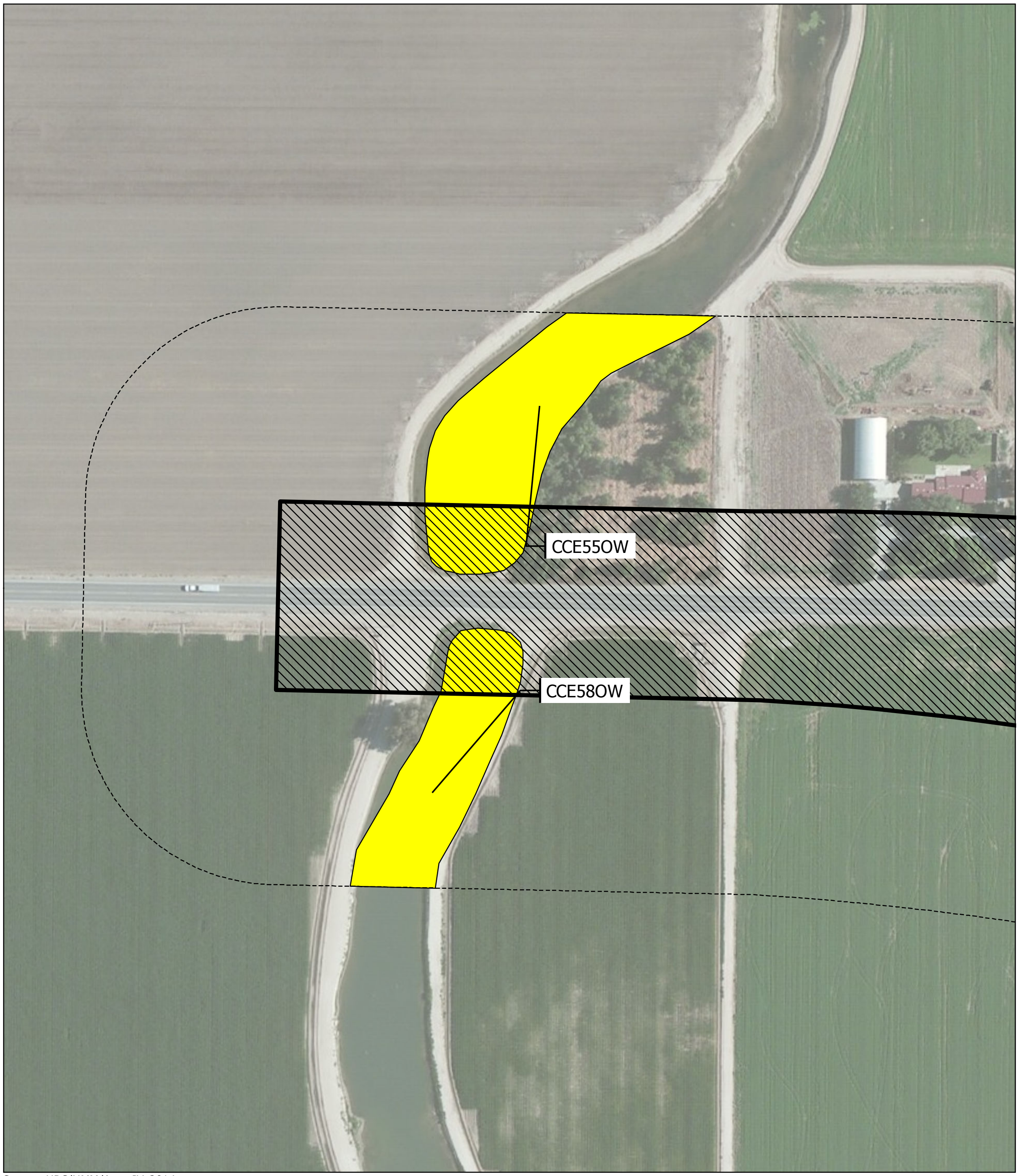
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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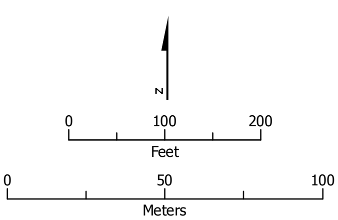

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

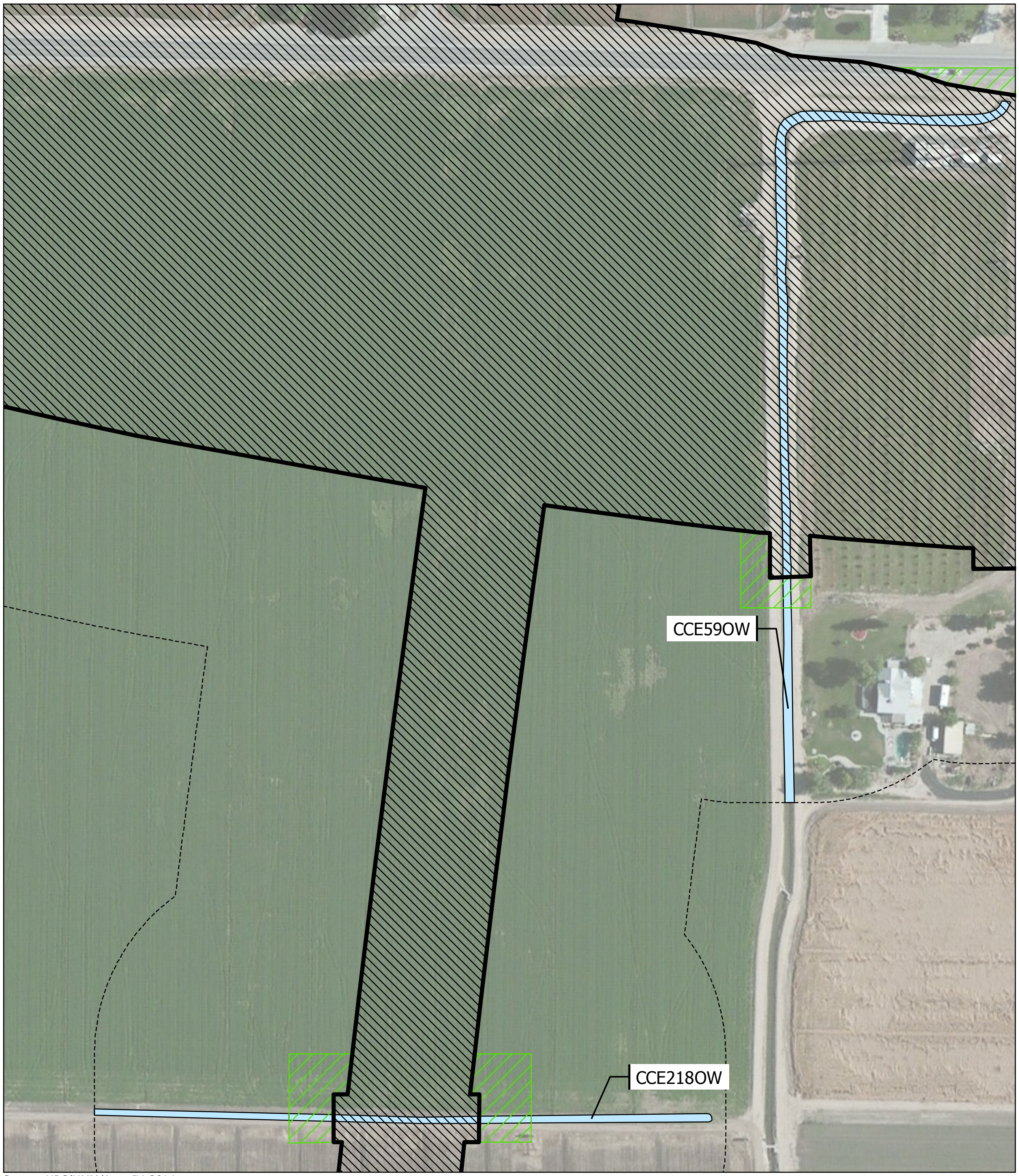

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

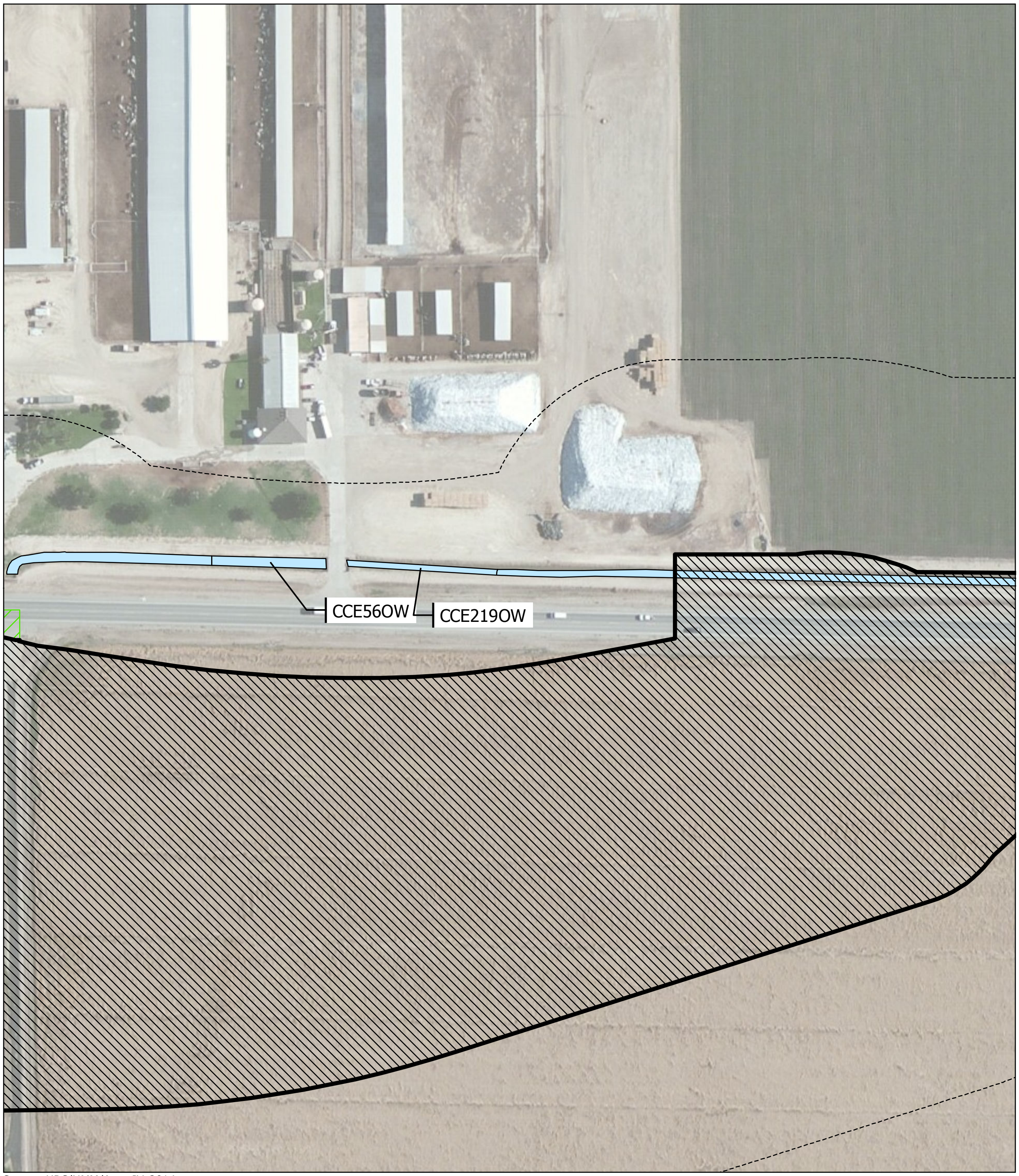
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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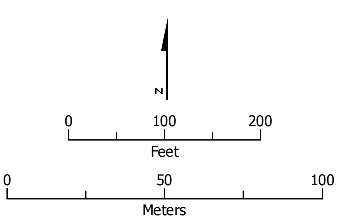
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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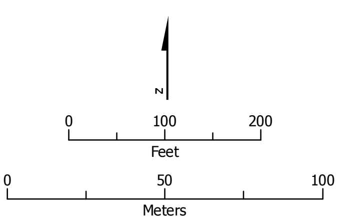
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



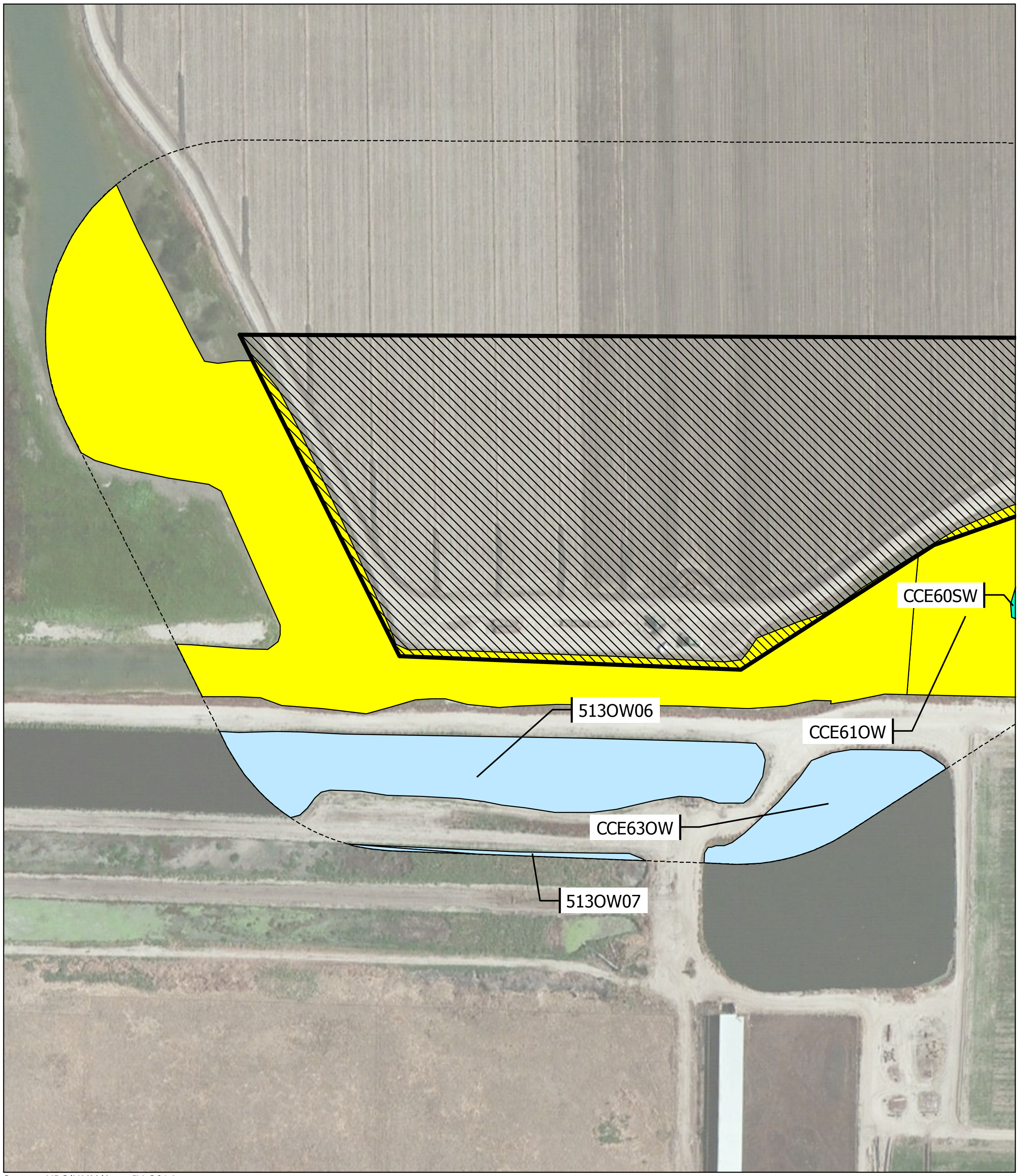
250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

- Direct - Permanent
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- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

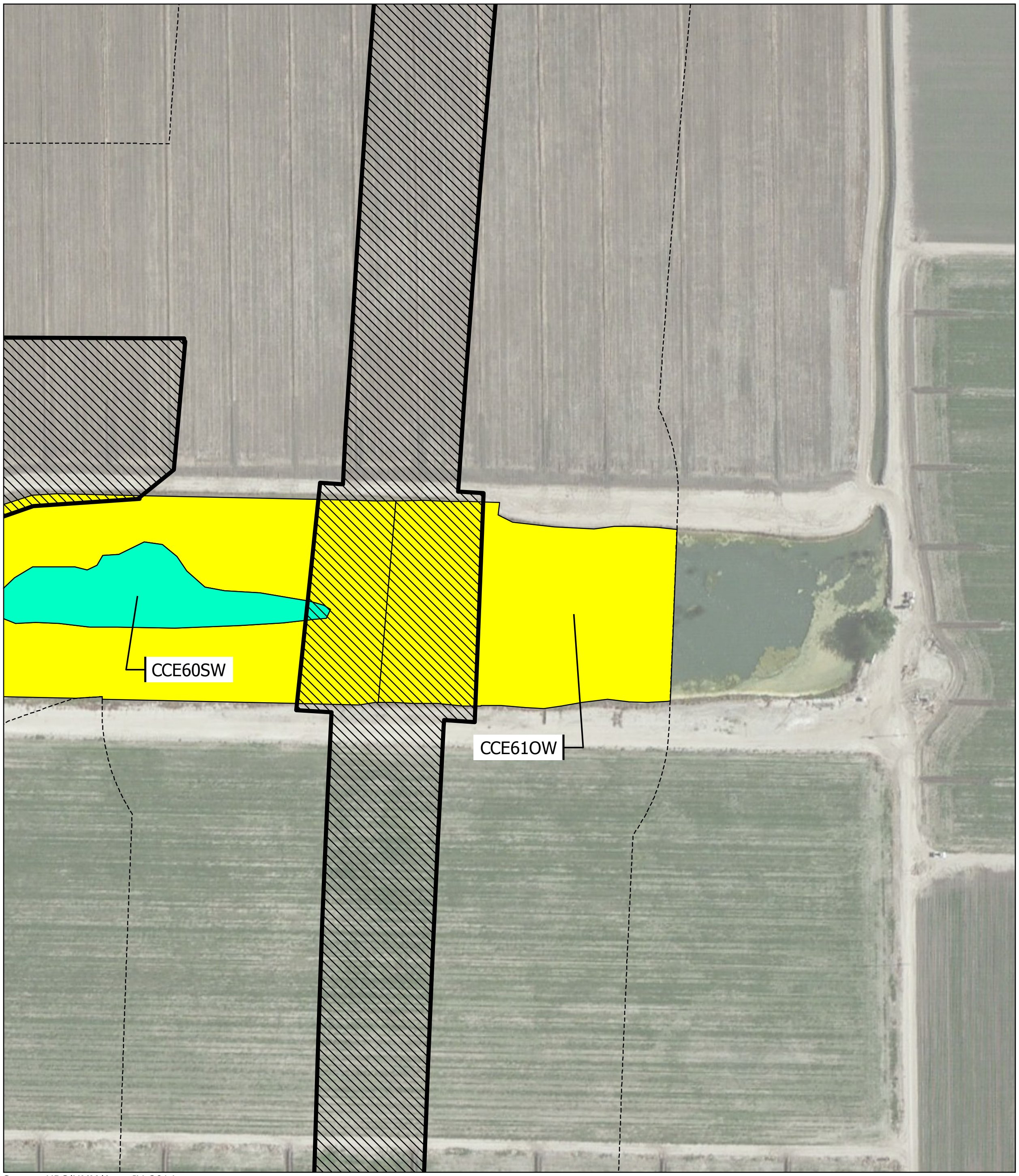

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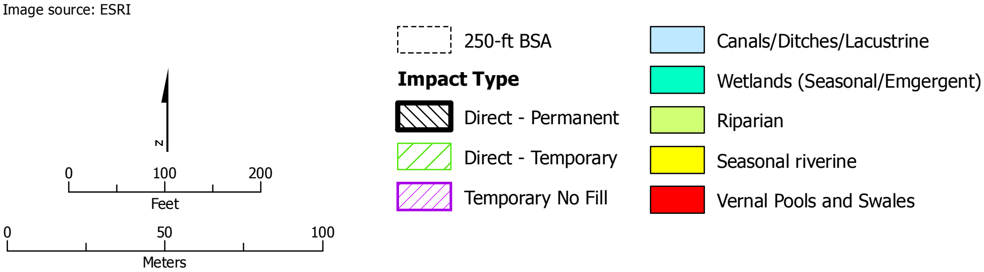
Image source: ESRI

January 22, 2014



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Project Impact Mapbook

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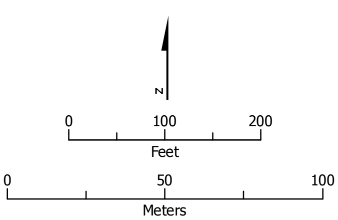
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

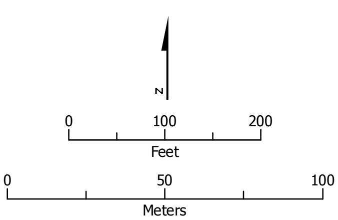
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

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Wetlands (Seasonal/Emgergent)

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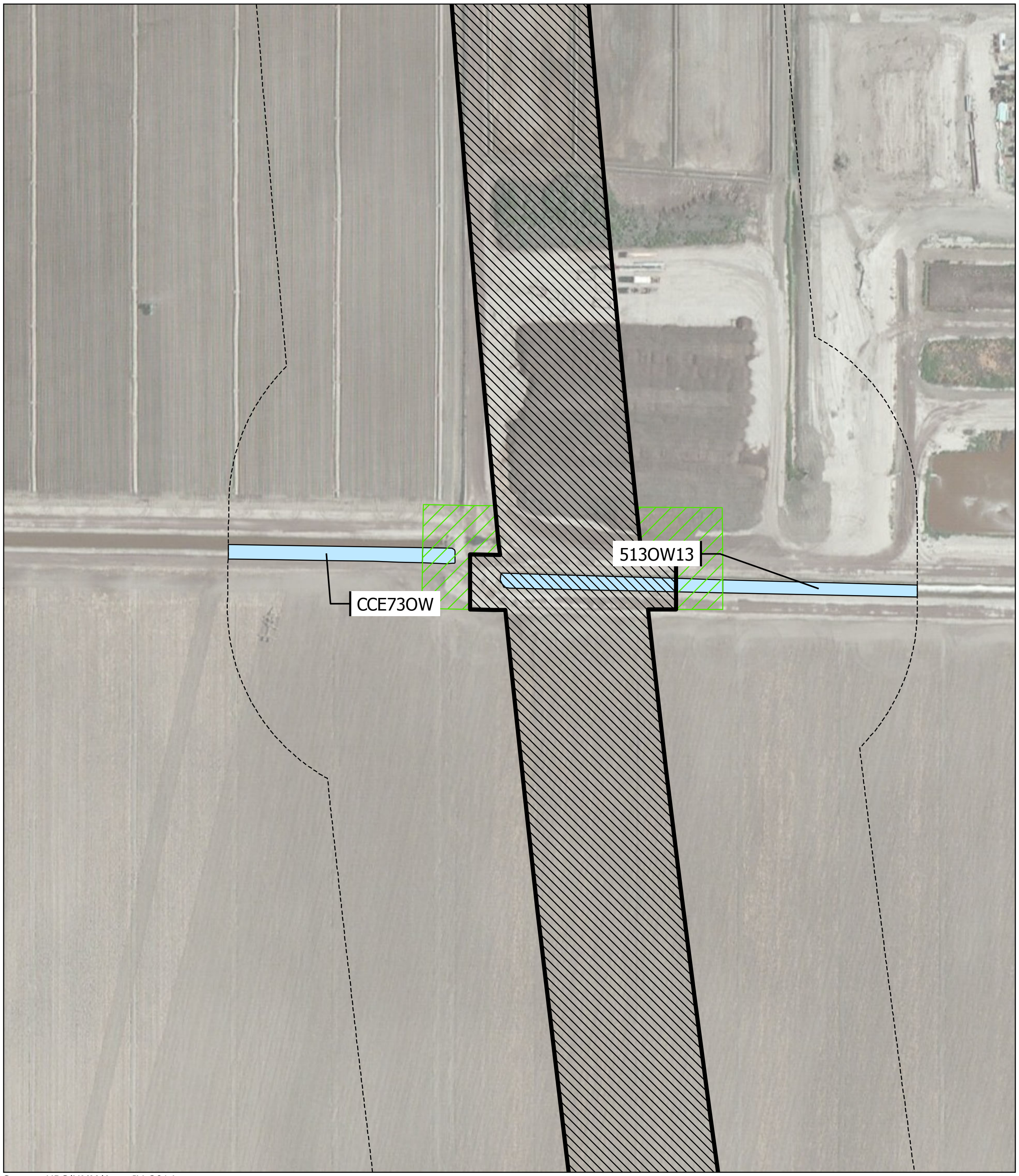
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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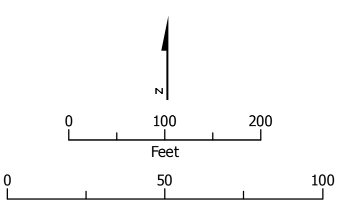
January 22, 2014



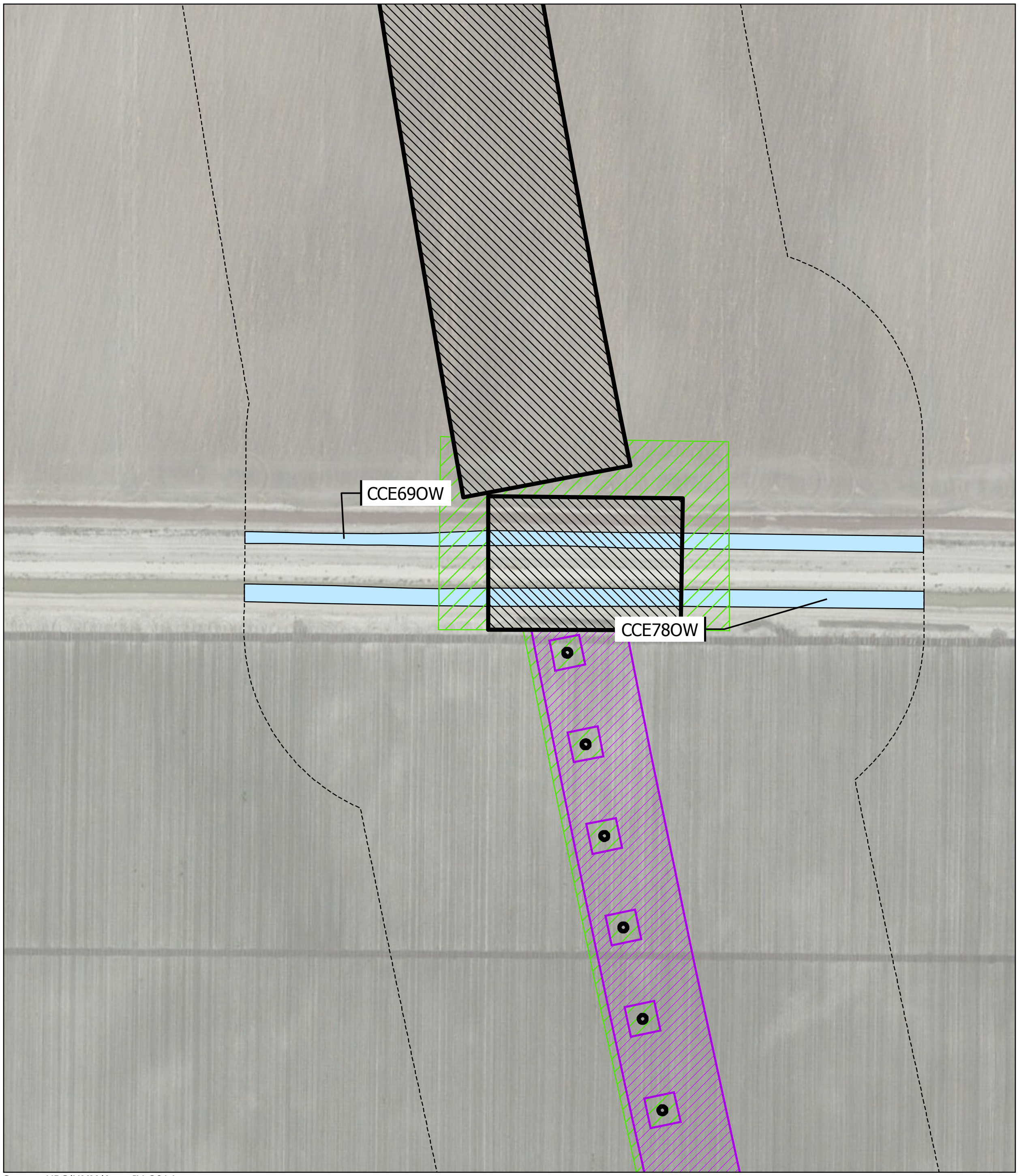
250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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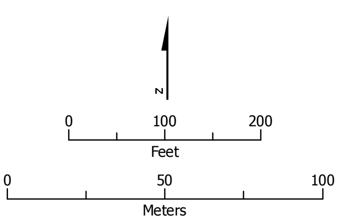
January 22, 2014



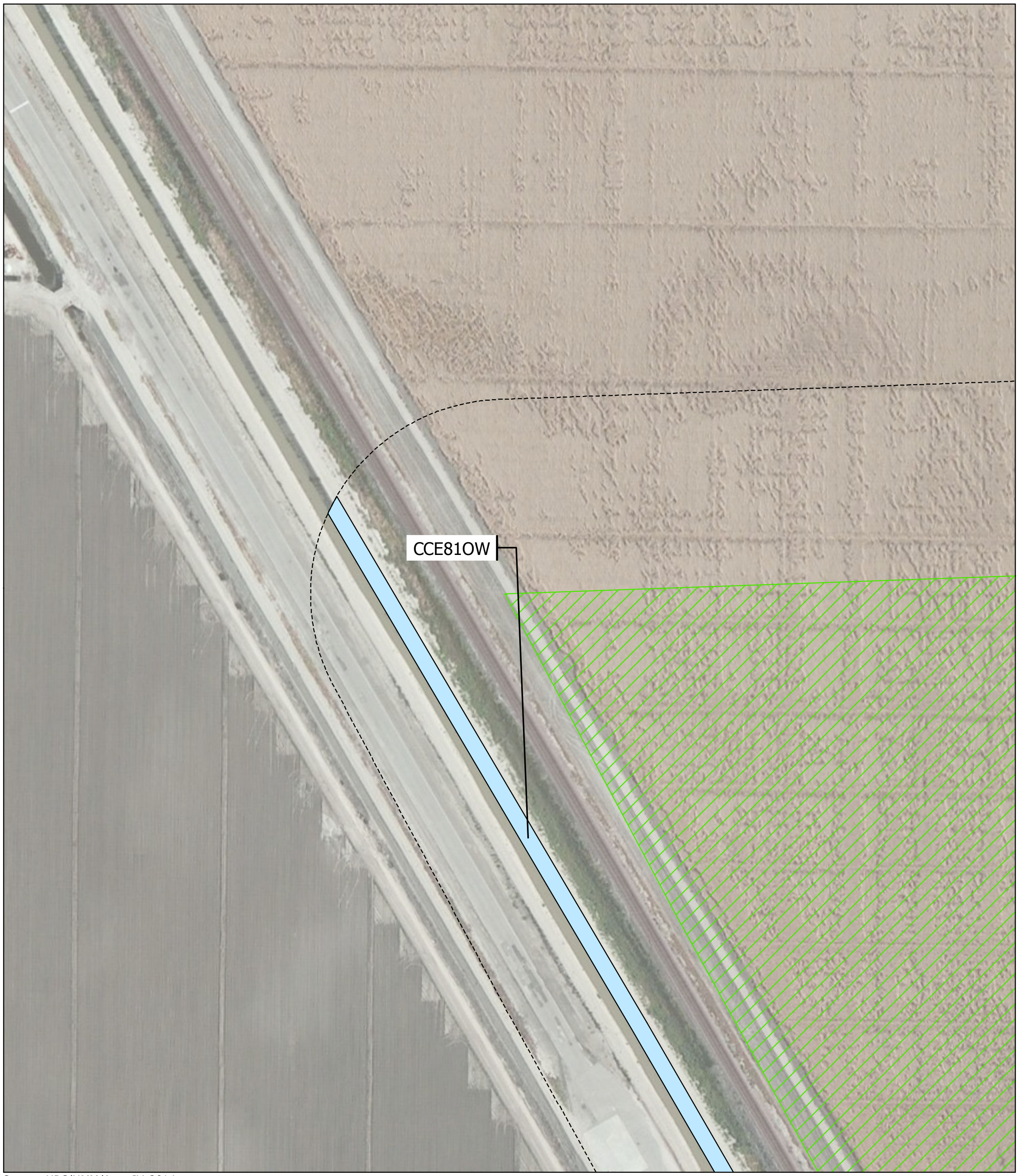
250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

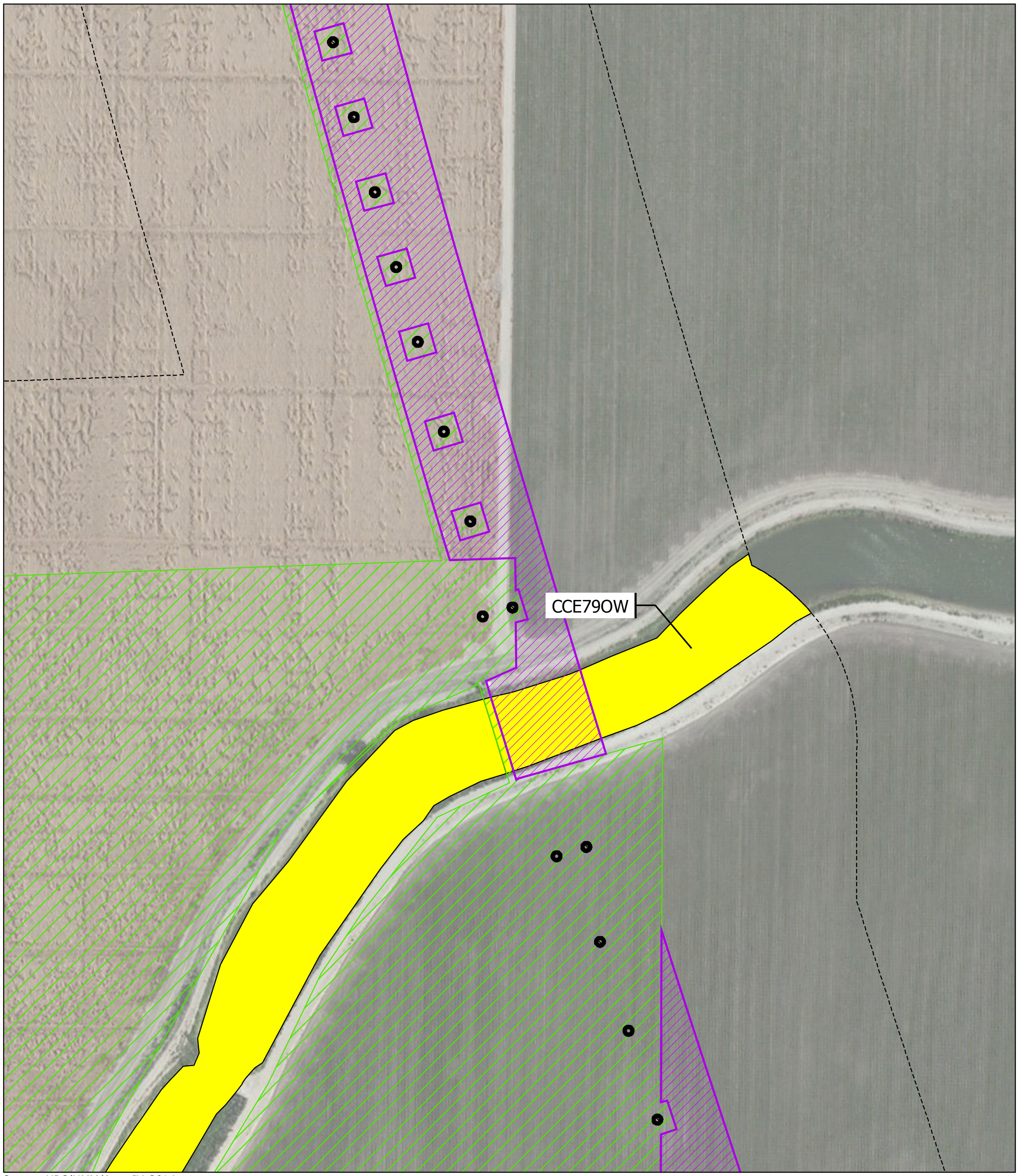

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
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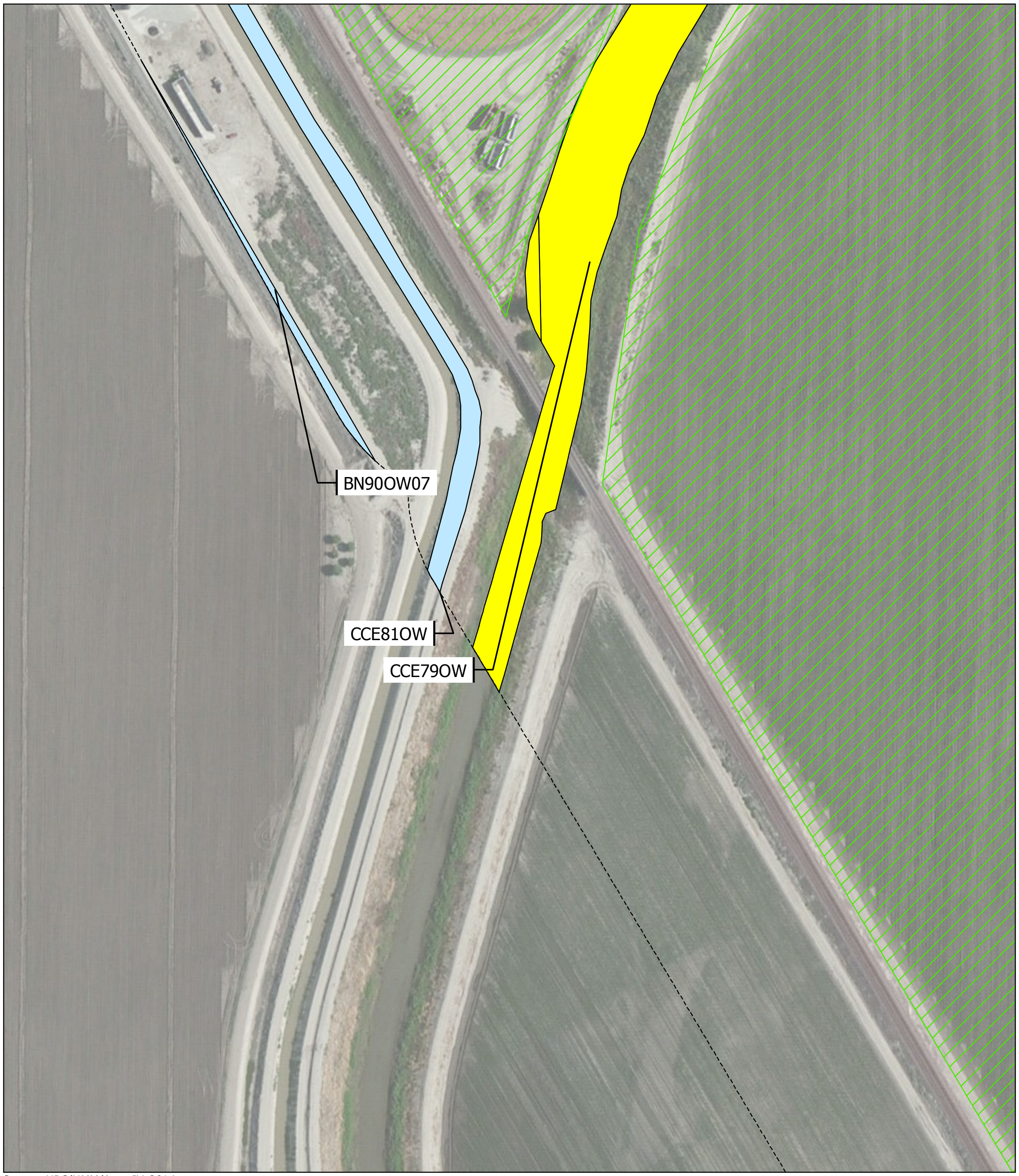
Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

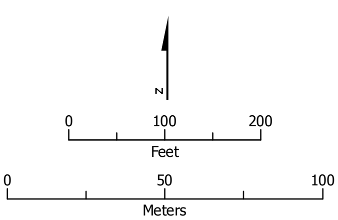
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Source: URS/HMM/Arup JV, 2014.
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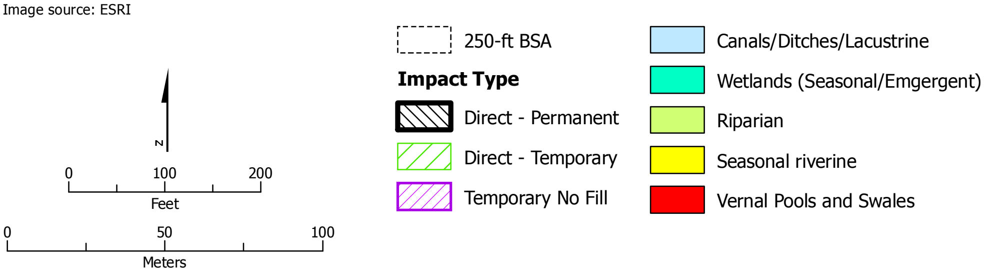

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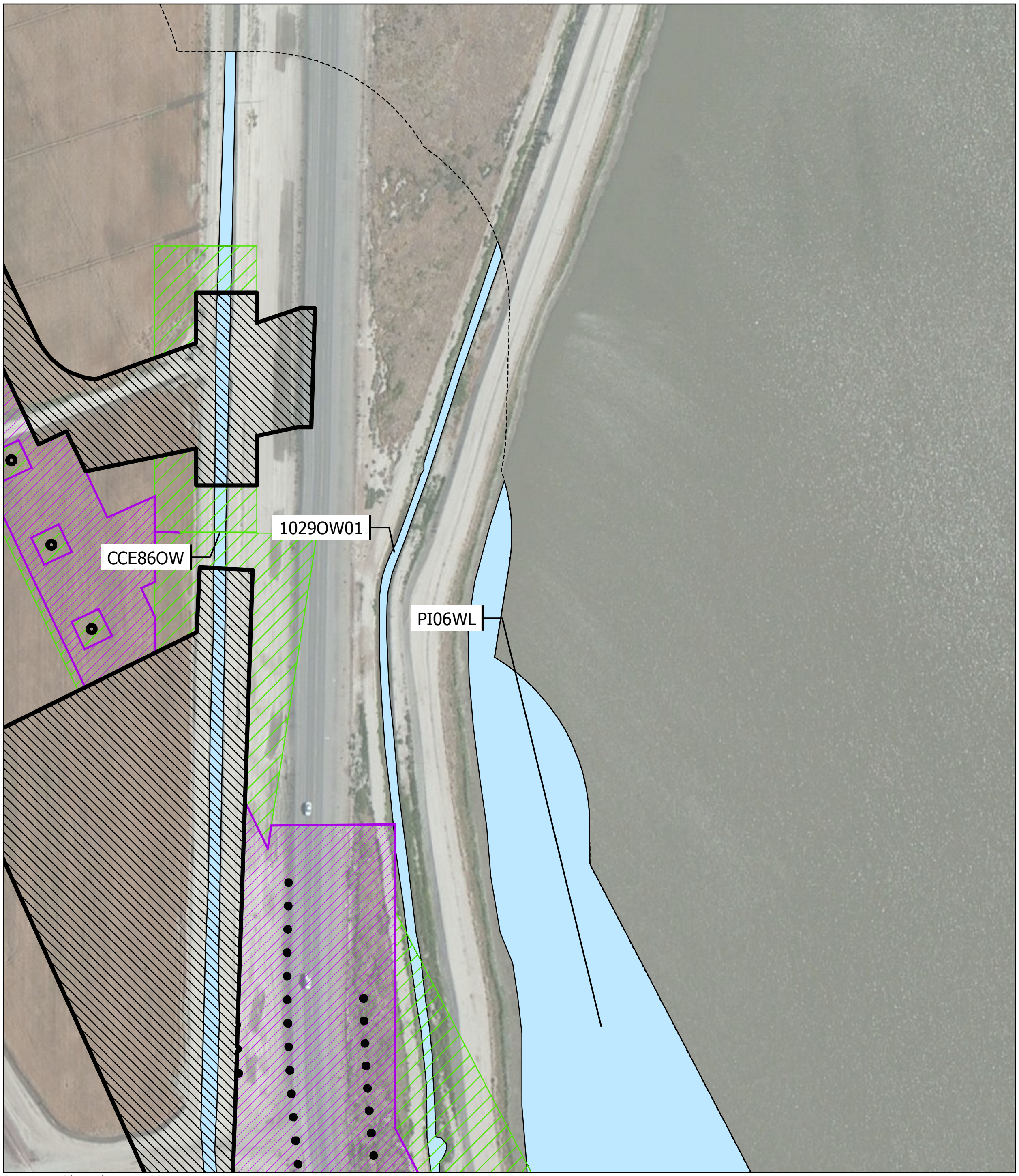

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

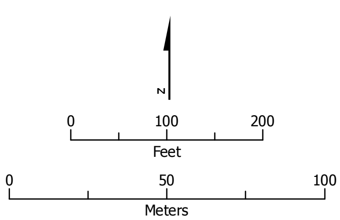
Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

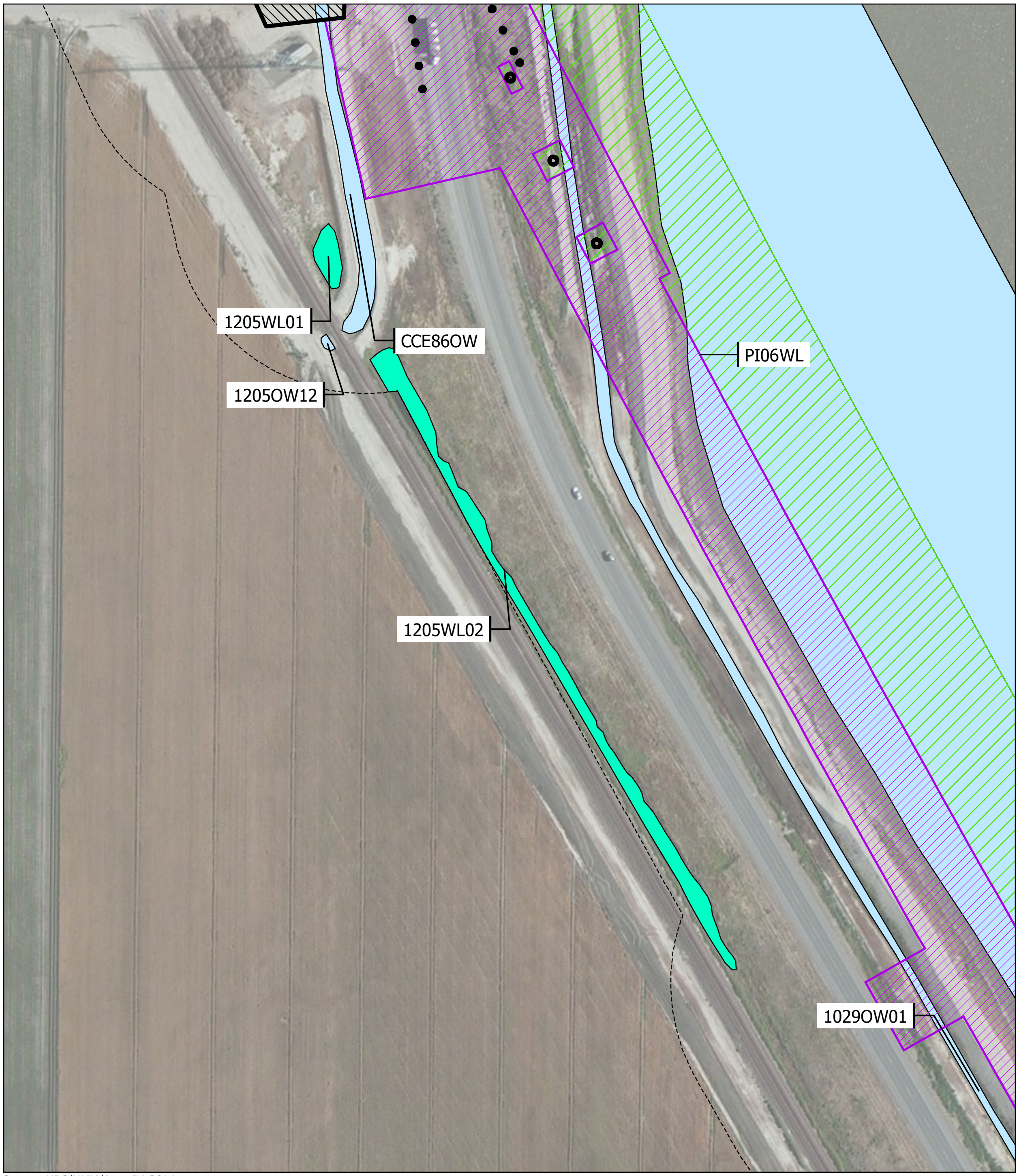
Riparian

Seasonal riverine

Vernal Pools and Swales



Appendix 4
Project Impact Mapbook



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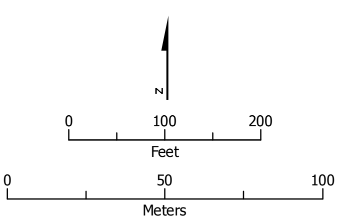

250-ft BSA

Impact Type

Direct - Permanent

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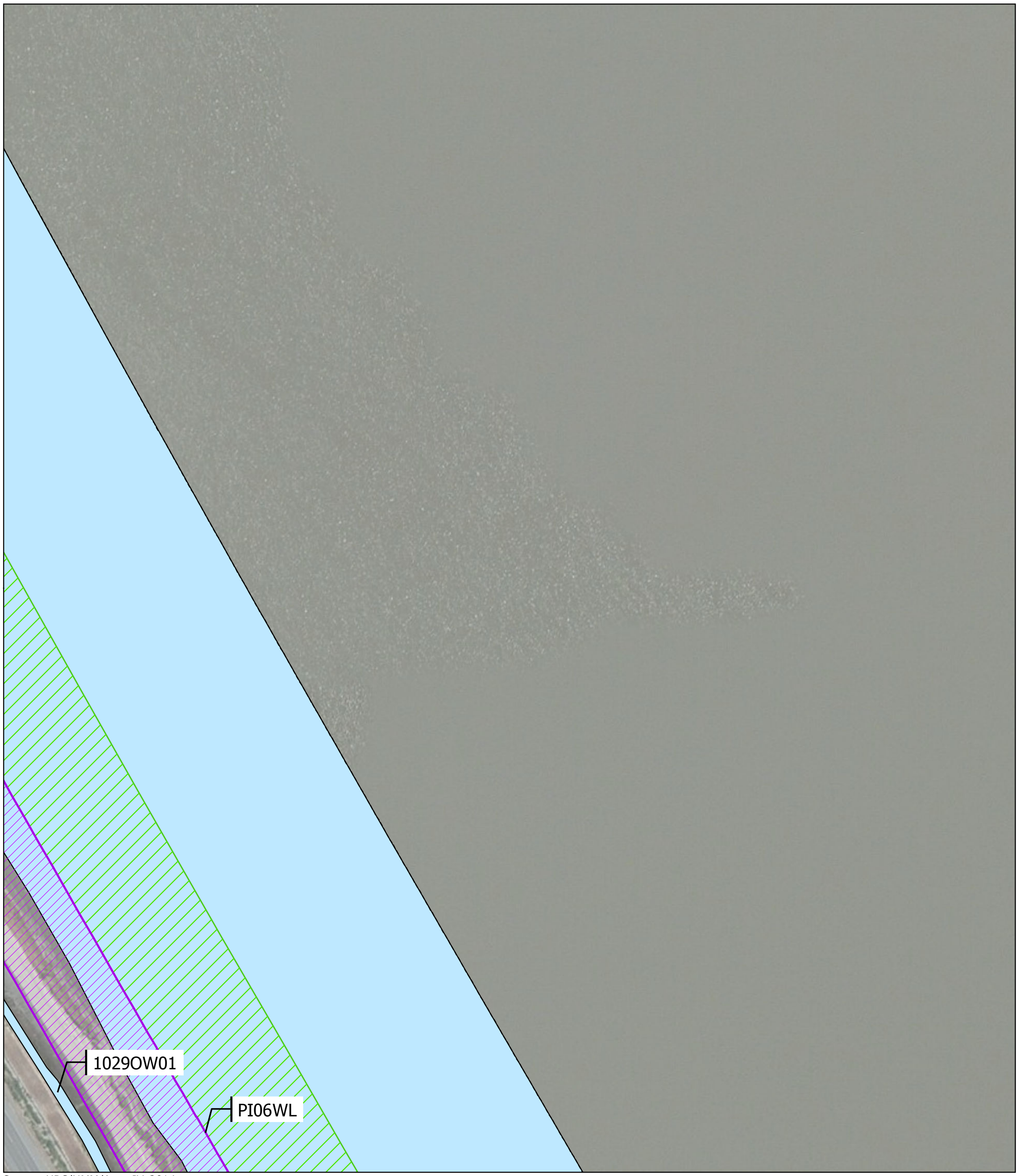
Project Impact Mapbook



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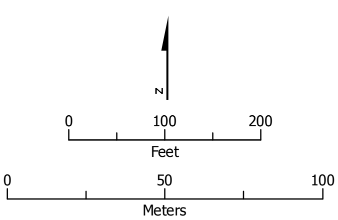
January 22, 2014



250-ft BSA

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Wetlands (Seasonal/Emgergent)

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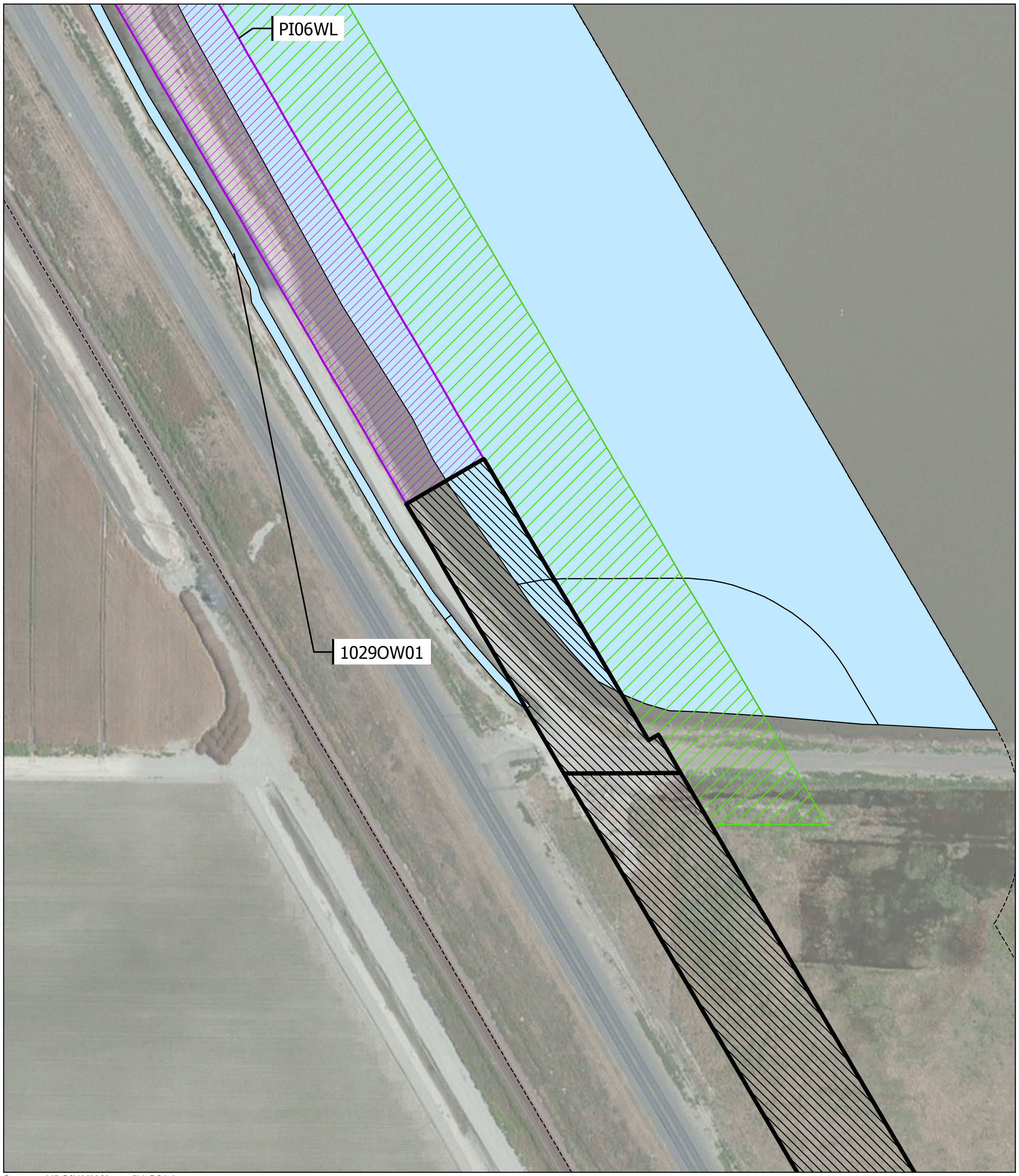

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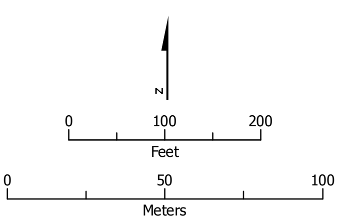

250-ft BSA

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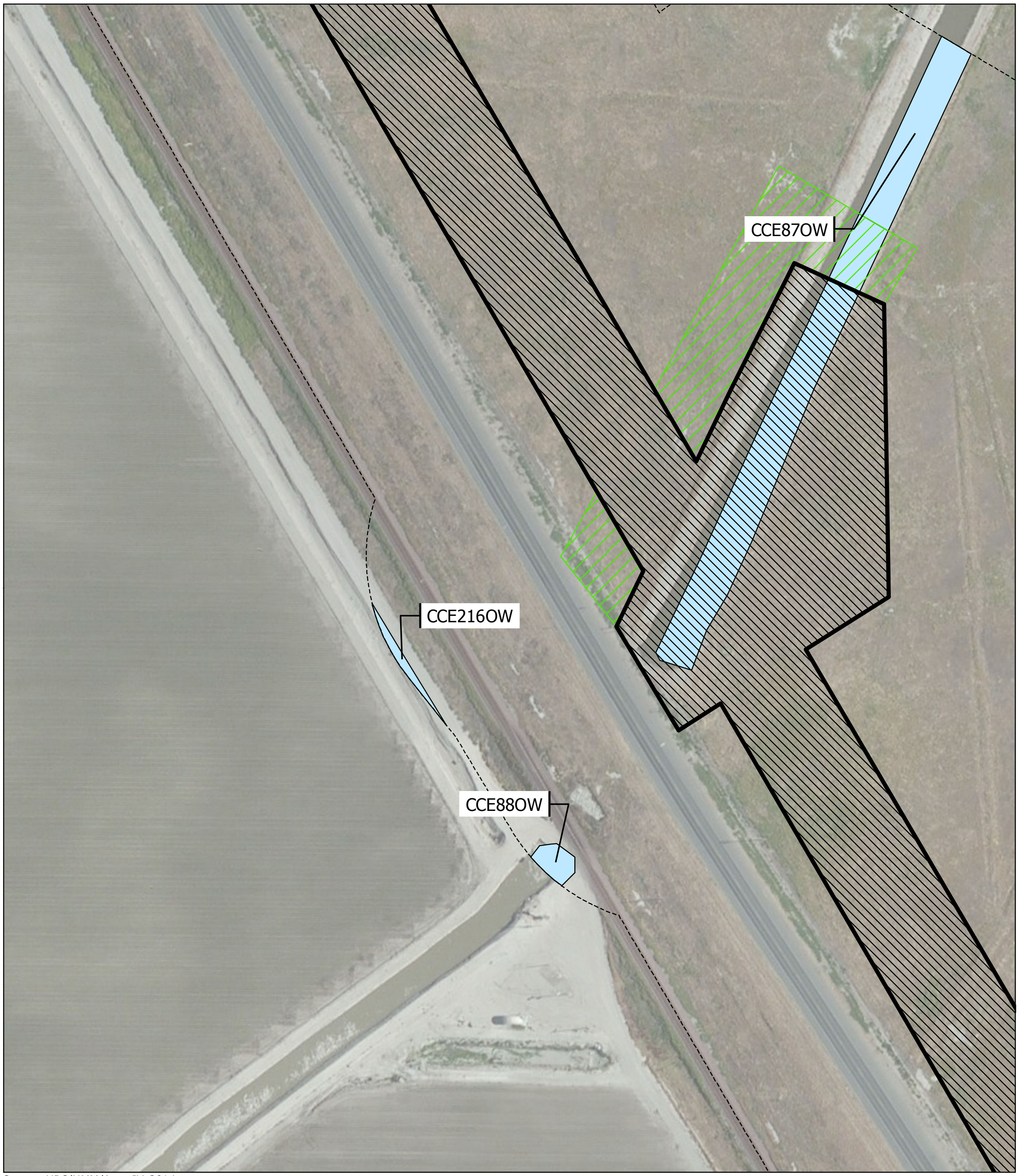
Appendix 4
Project Impact Mapbook



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January 22, 2014

250-ft BSA

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Direct - Permanent

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0 100 200
Feet

0 50 100
Meters

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Project Impact Mapbook

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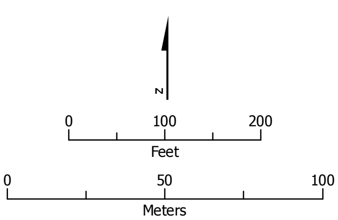

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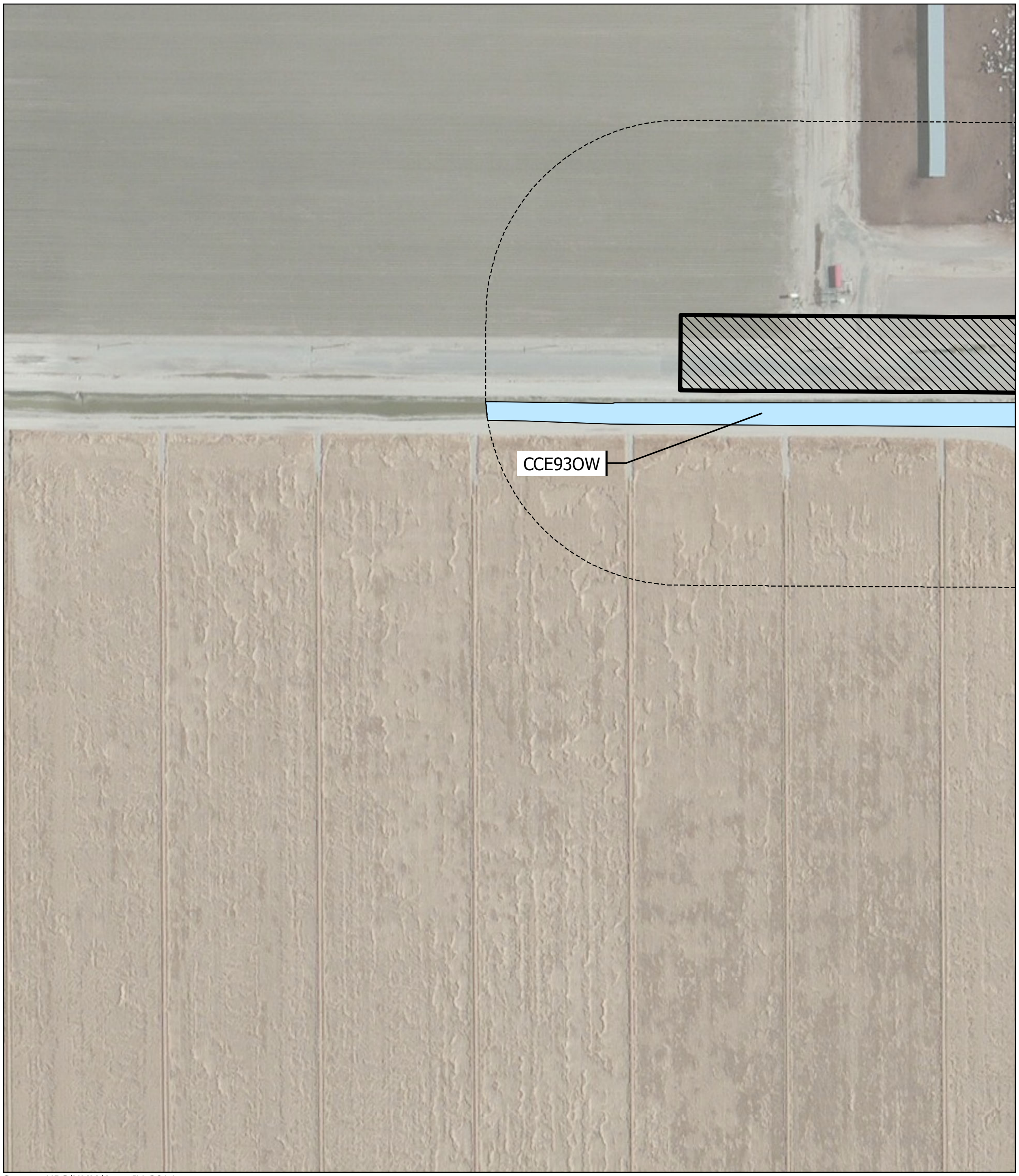

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January 22, 2014

250-ft BSA

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N

0 100 200
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Meters

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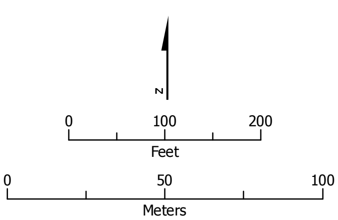

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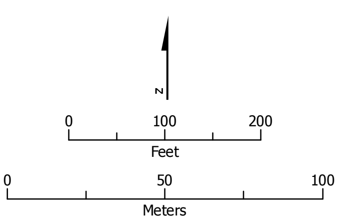

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Appendix 4
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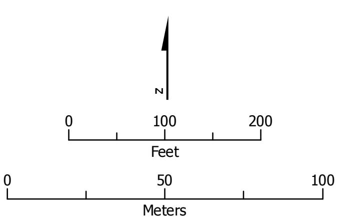

250-ft BSA

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Wetlands (Seasonal/Emergent)

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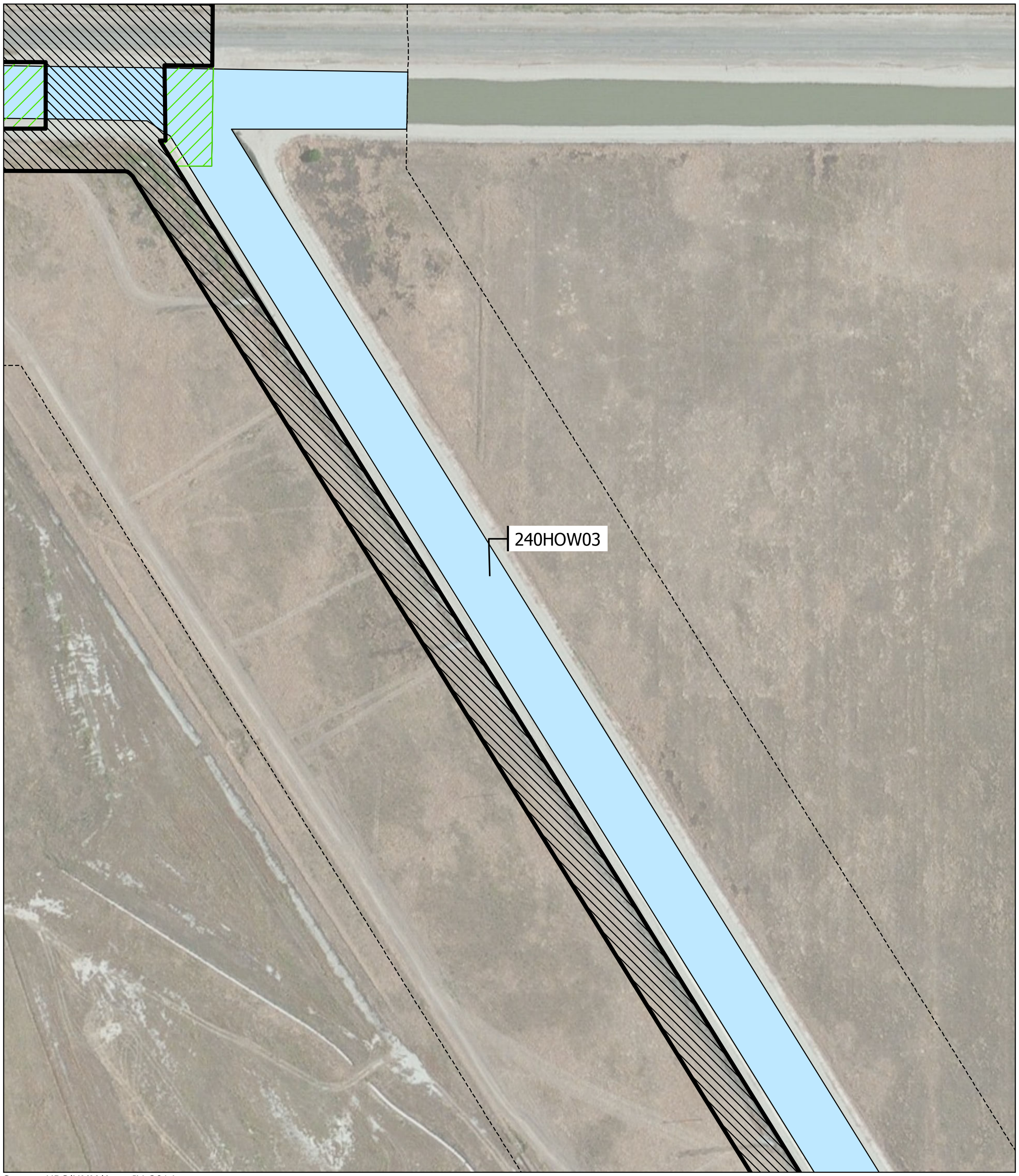

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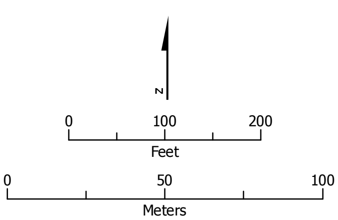

250-ft BSA

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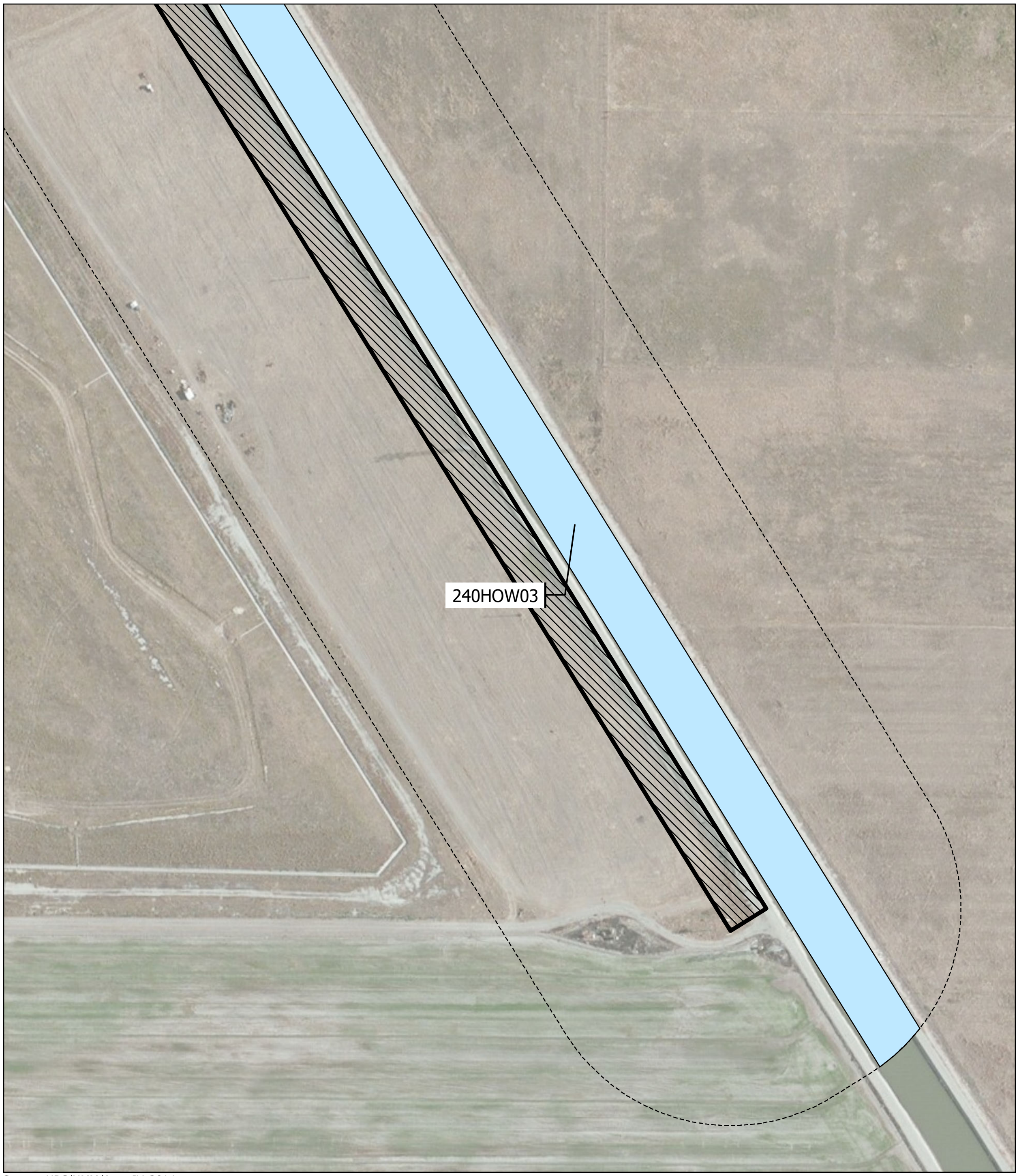

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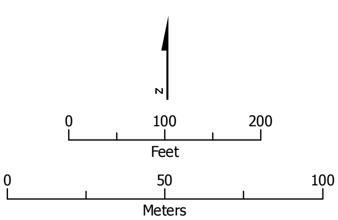

250-ft BSA

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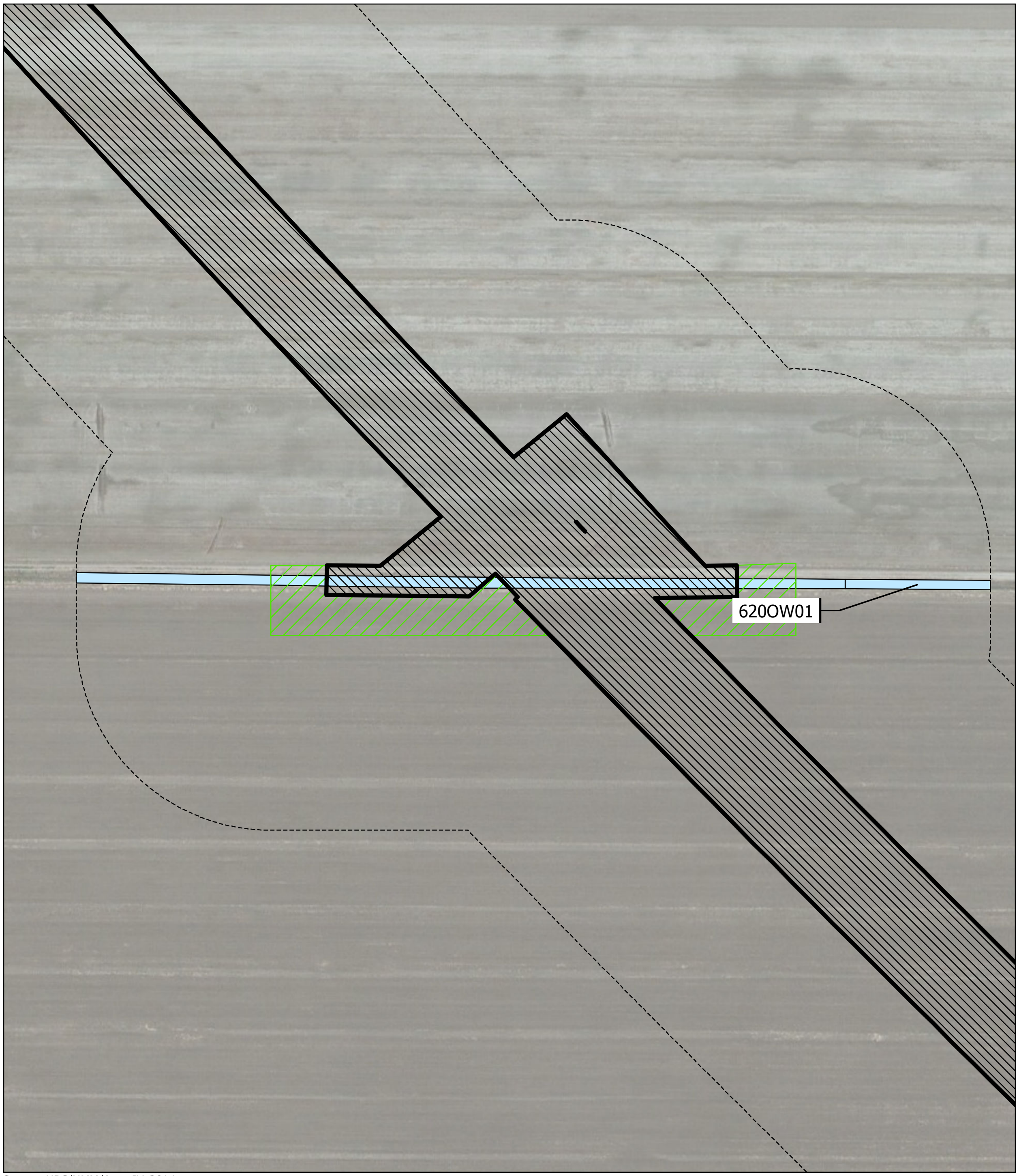
Project Impact Mapbook



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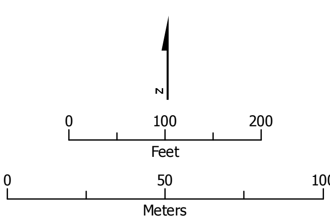

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

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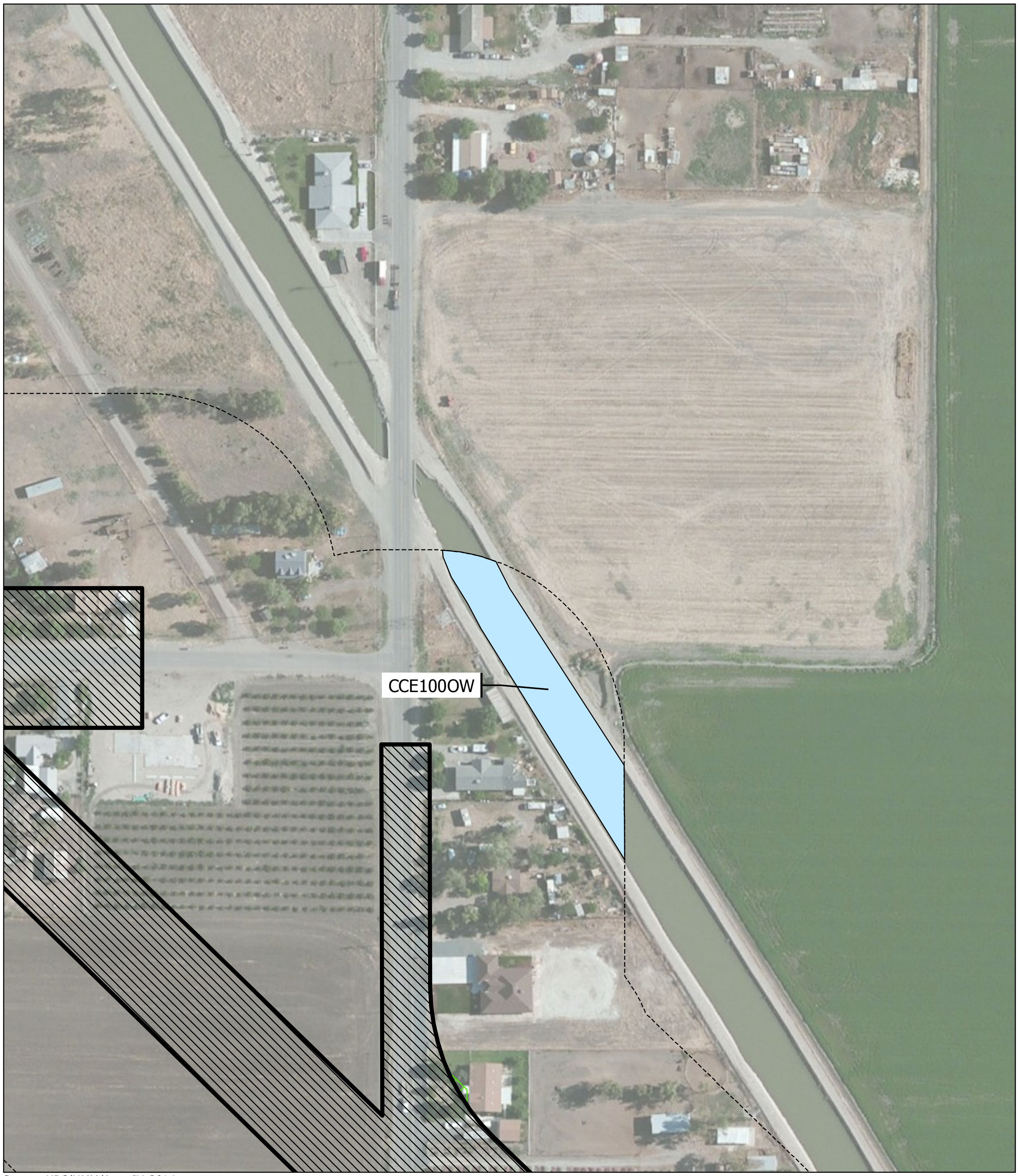
Project Impact Mapbook



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N

0 100 200
Feet

0 50 100
Meters

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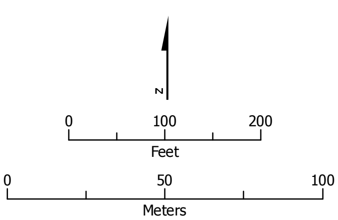
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

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Project Impact Mapbook

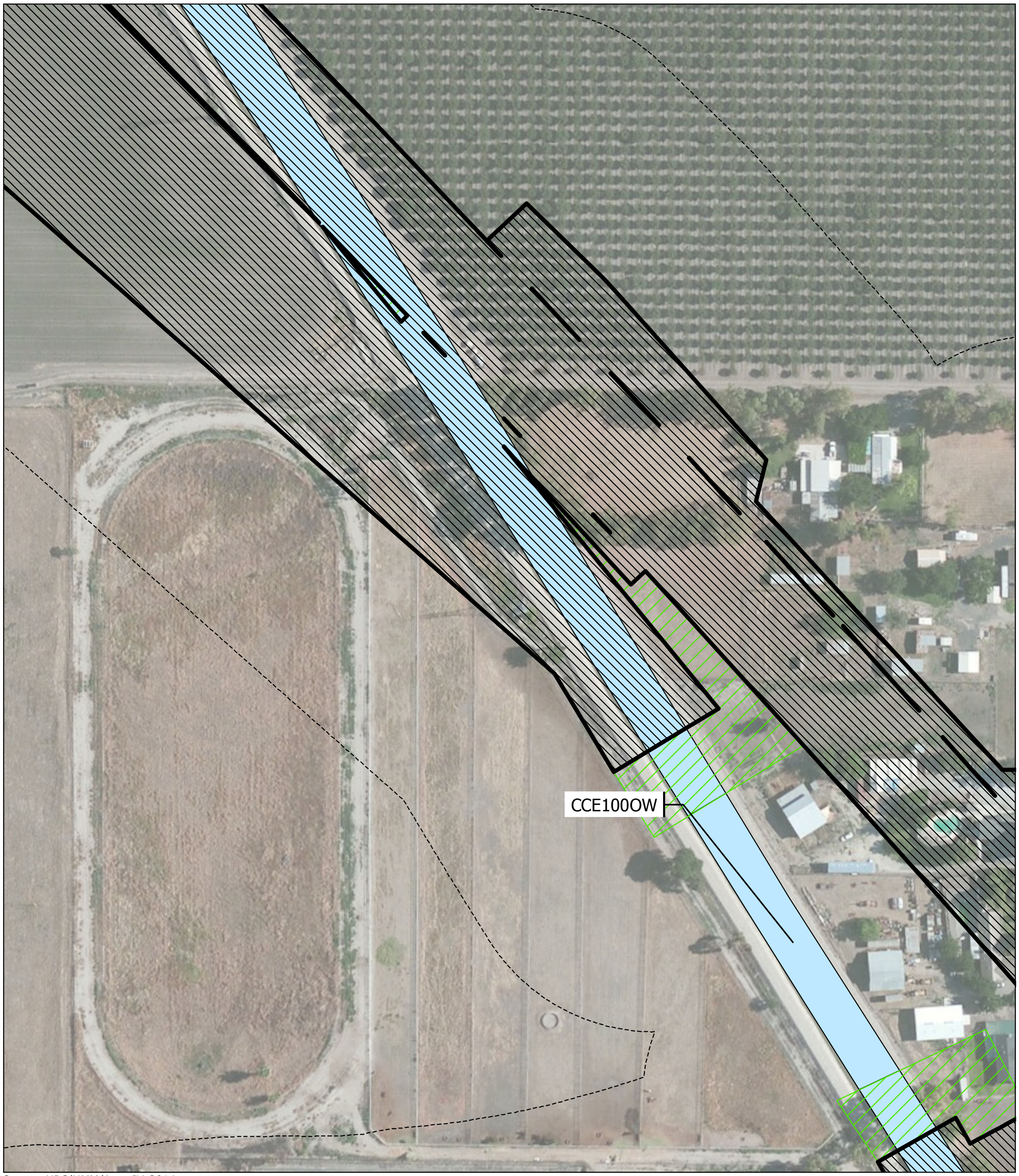

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Wetlands (Seasonal/Emergent)

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Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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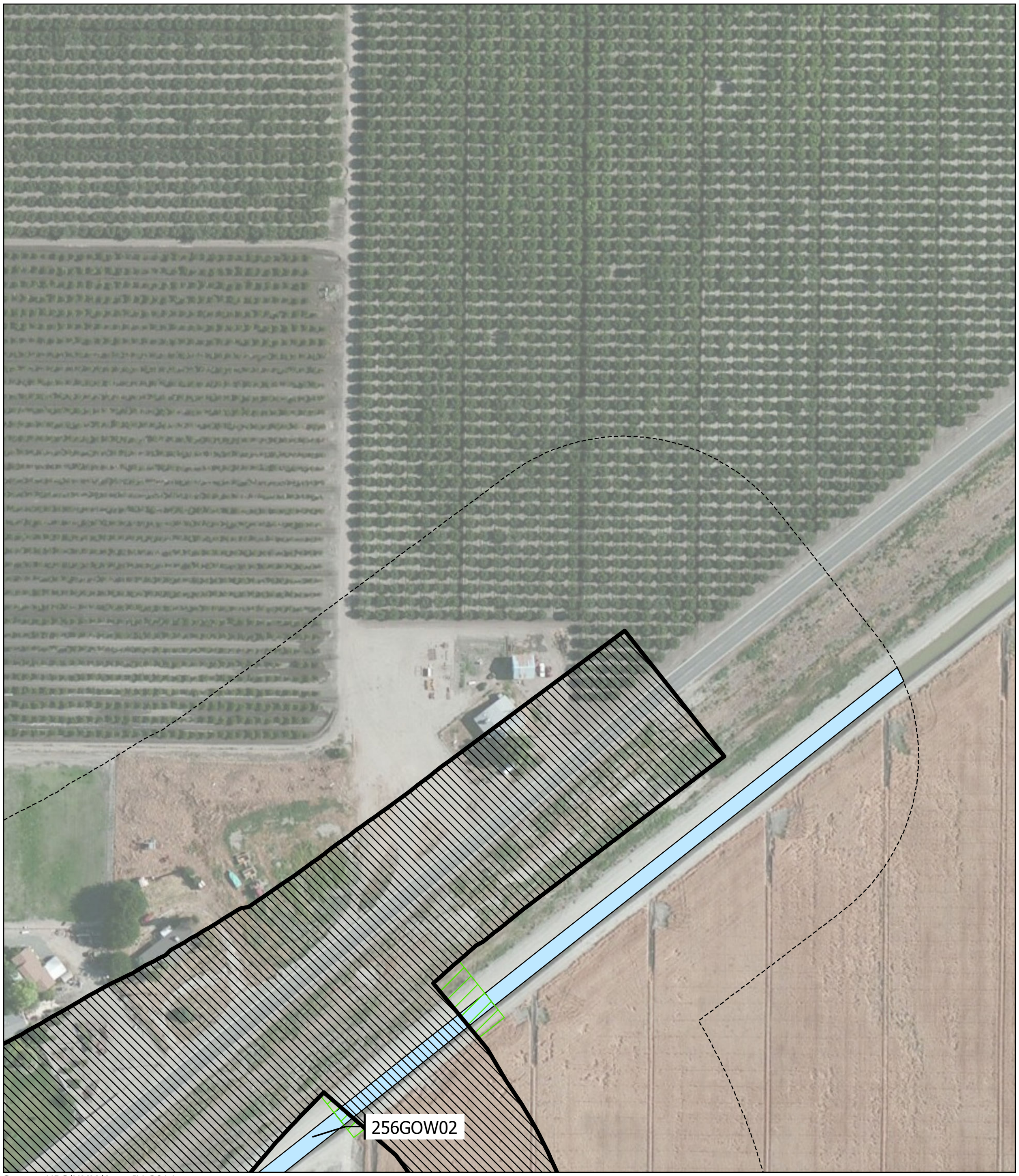

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0 100 200
Feet

0 50 100
Meters

250-ft BSA

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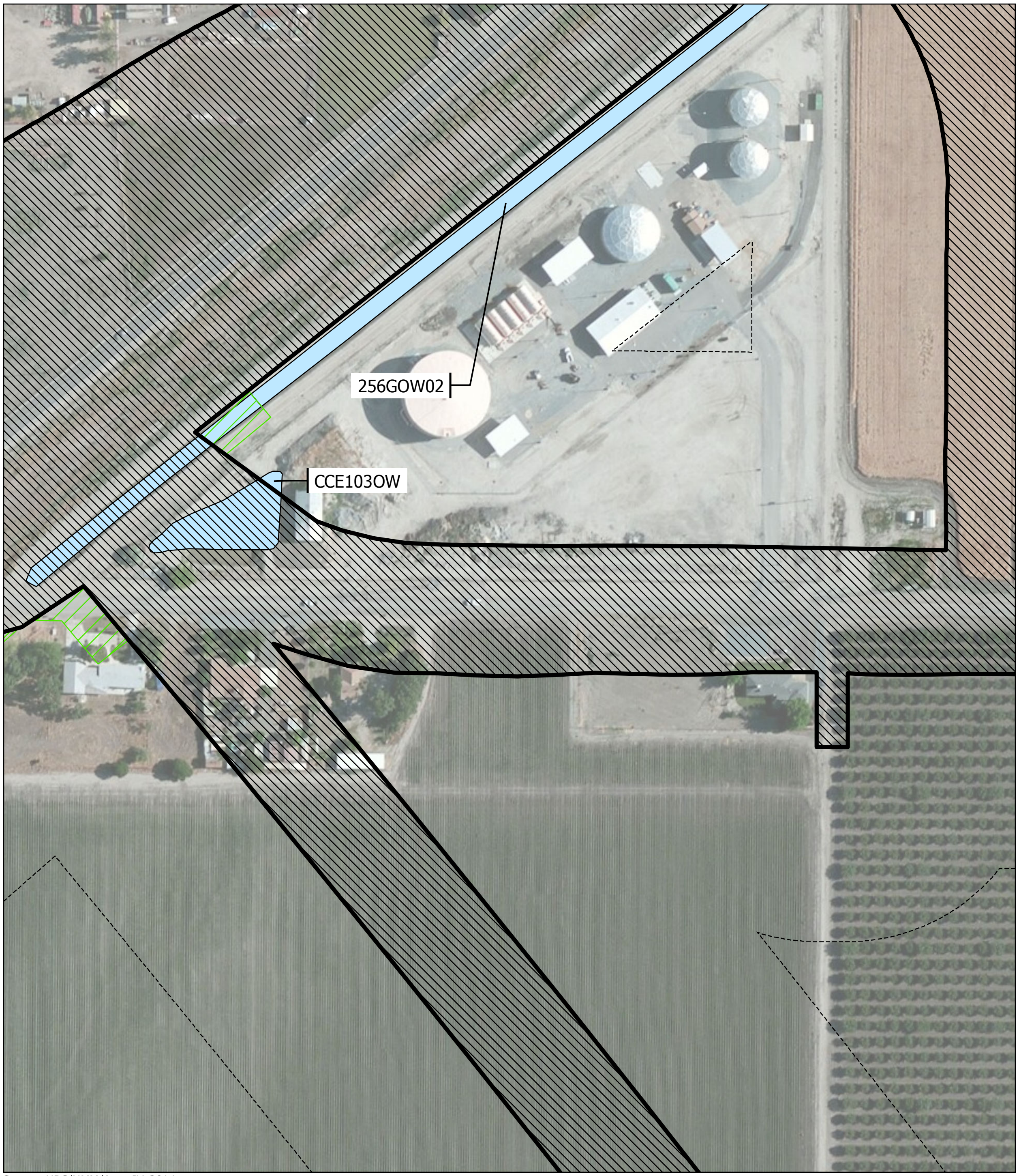

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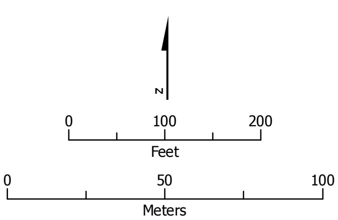

250-ft BSA

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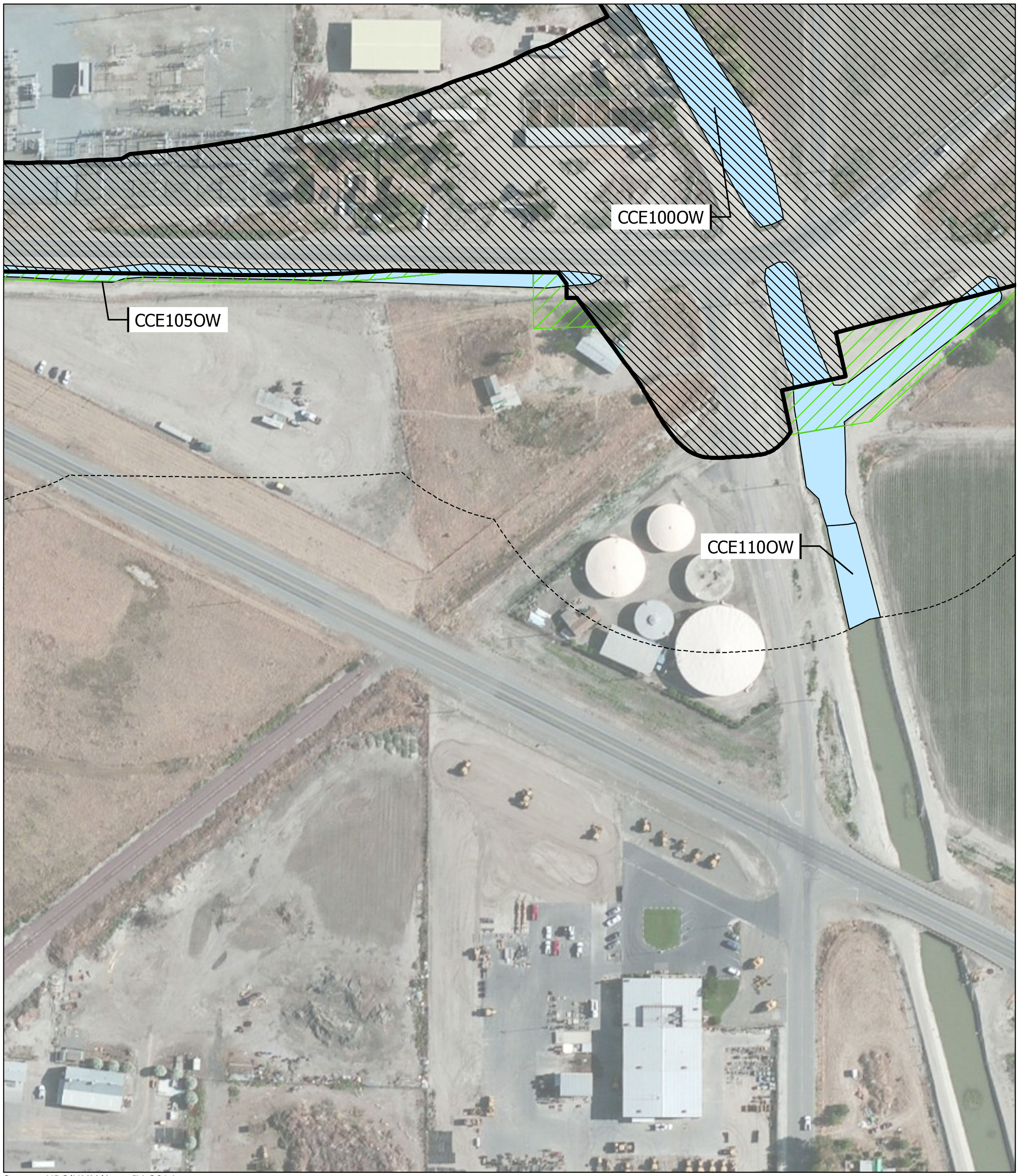

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January 22, 2014

250-ft BSA

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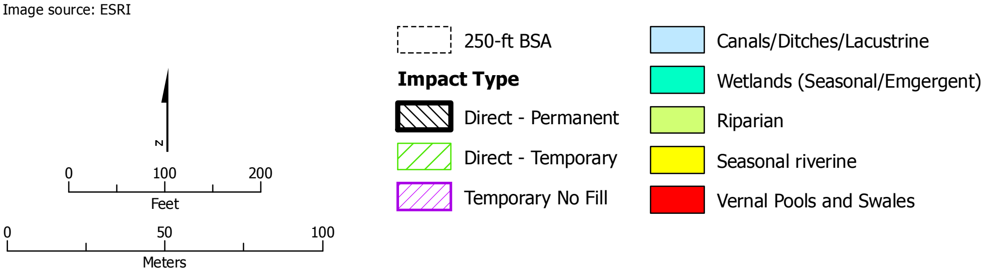

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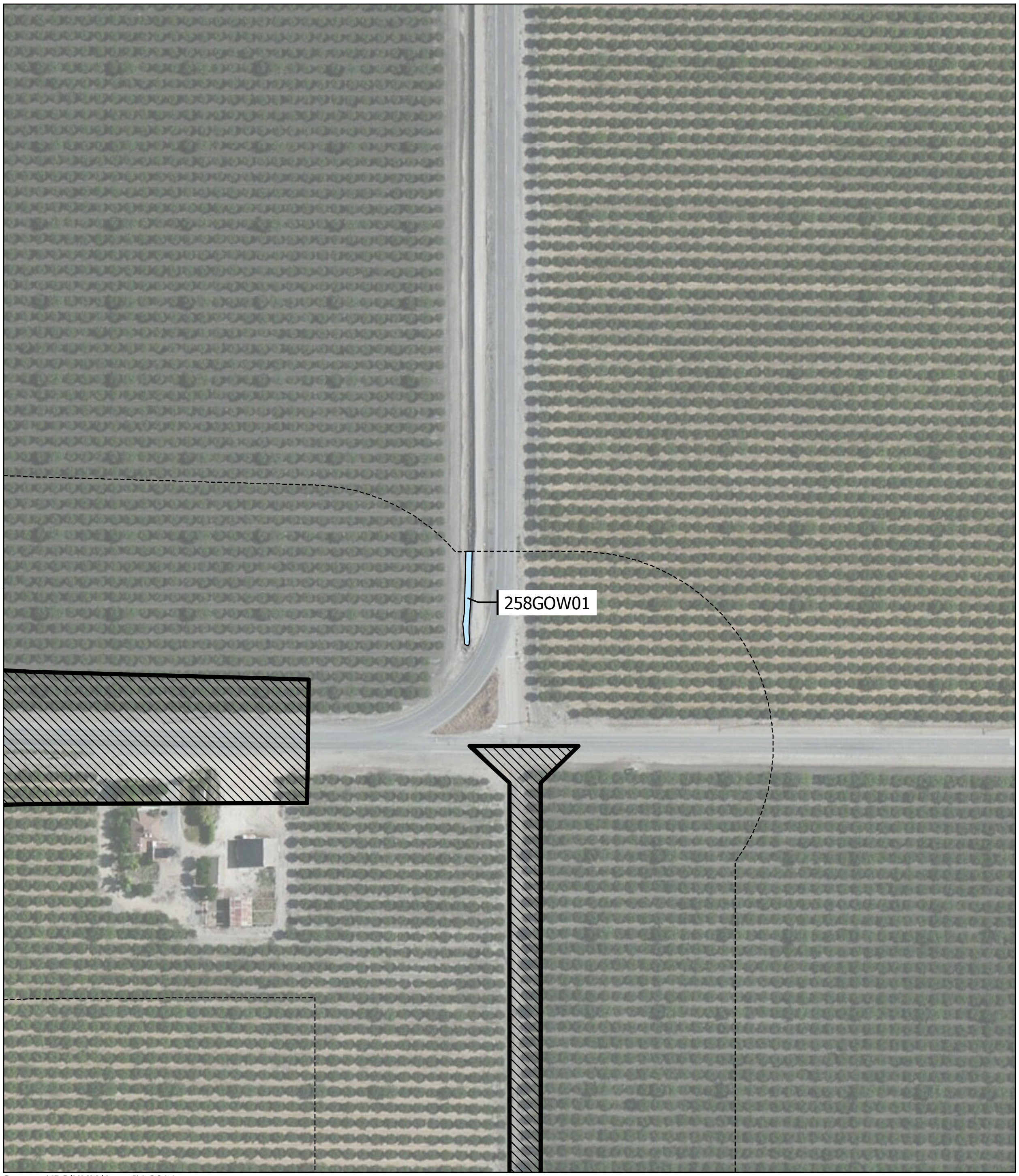

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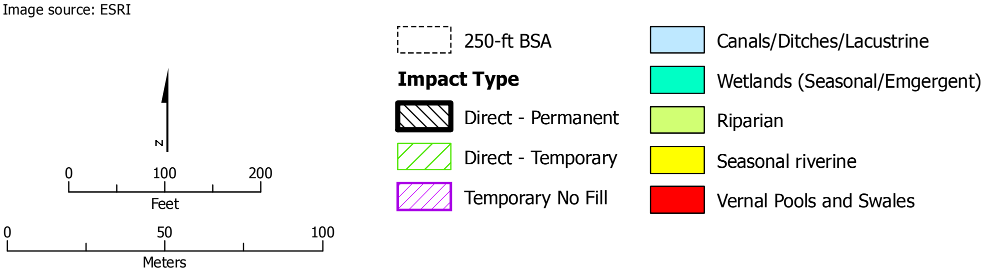

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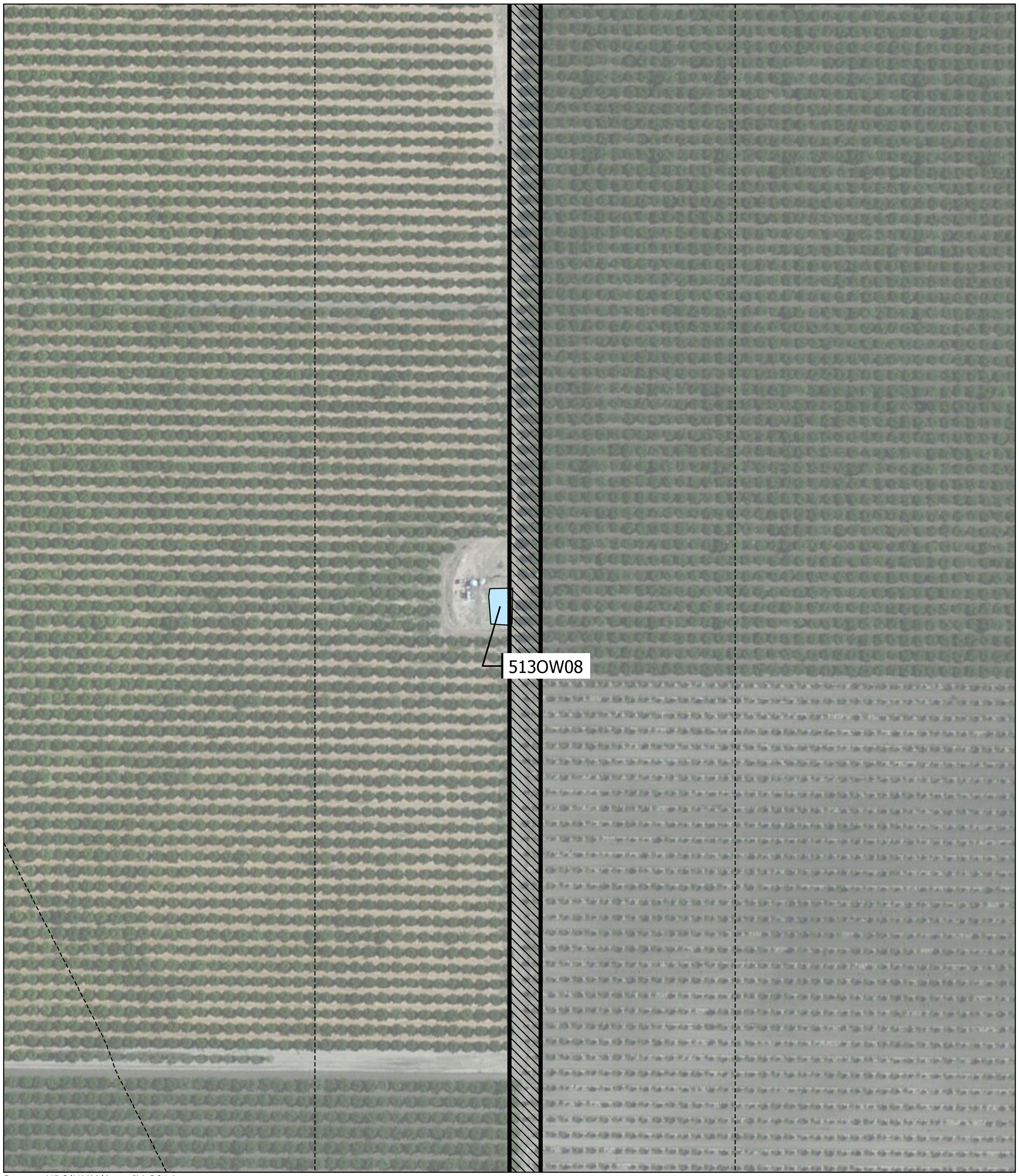

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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

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Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

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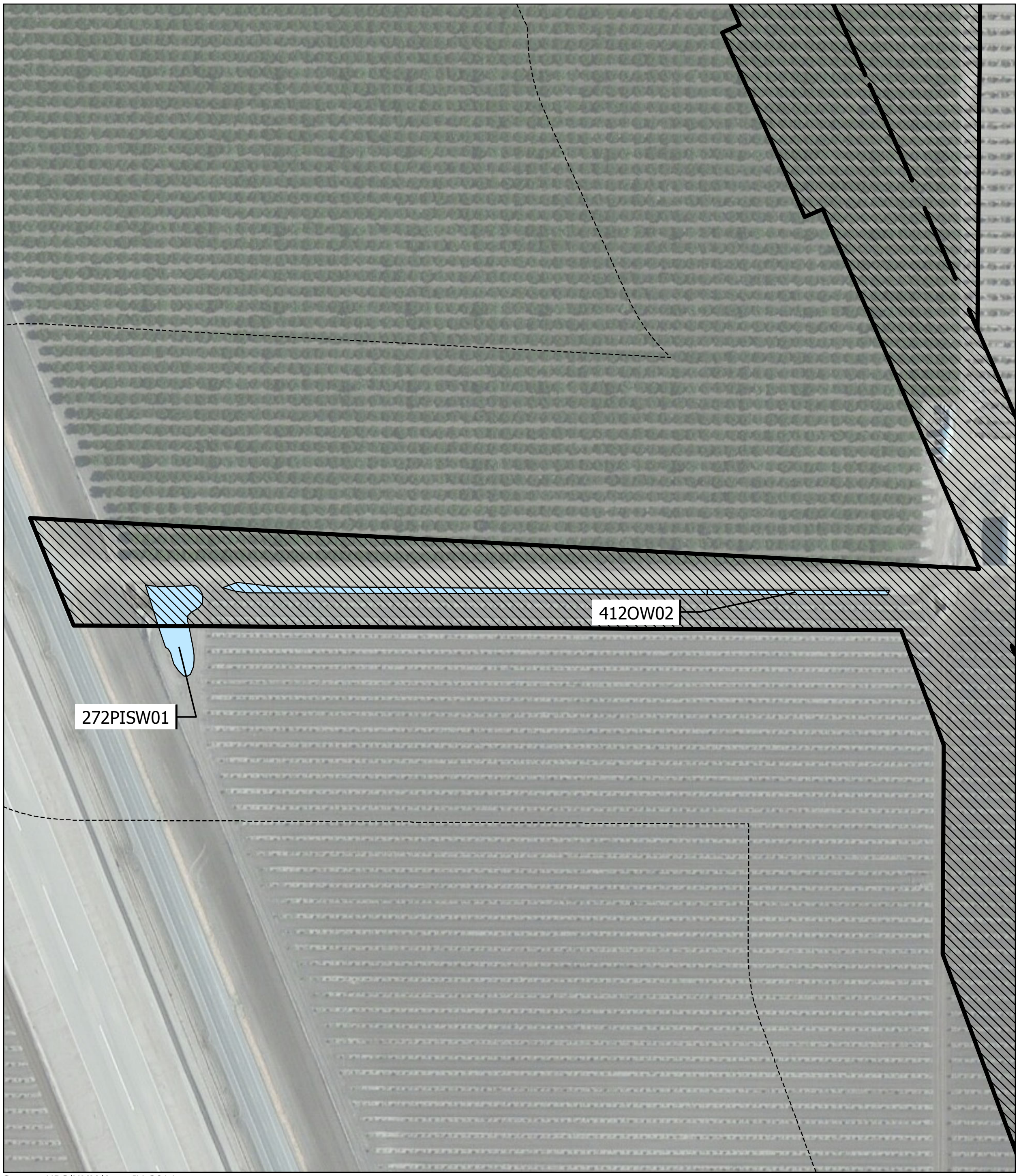

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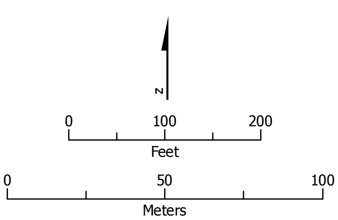

250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

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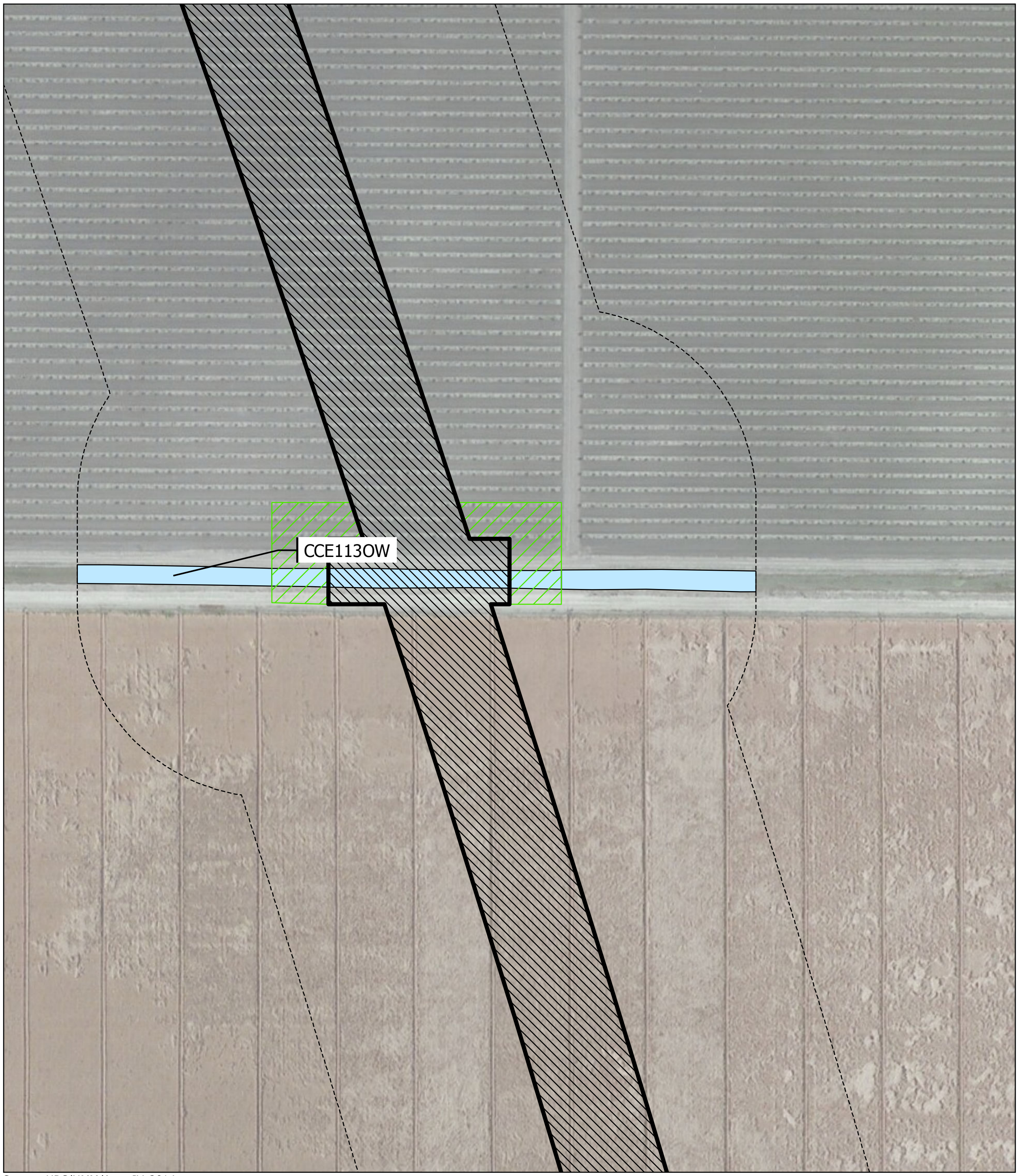
Project Impact Mapbook



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250-ft BSA

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N

0 100 200
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0 50 100
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Source: URS/HMM/Arup JV, 2014.
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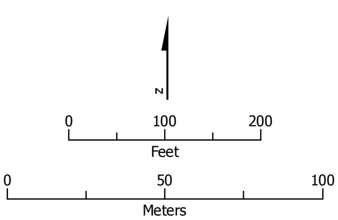

250-ft BSA

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Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
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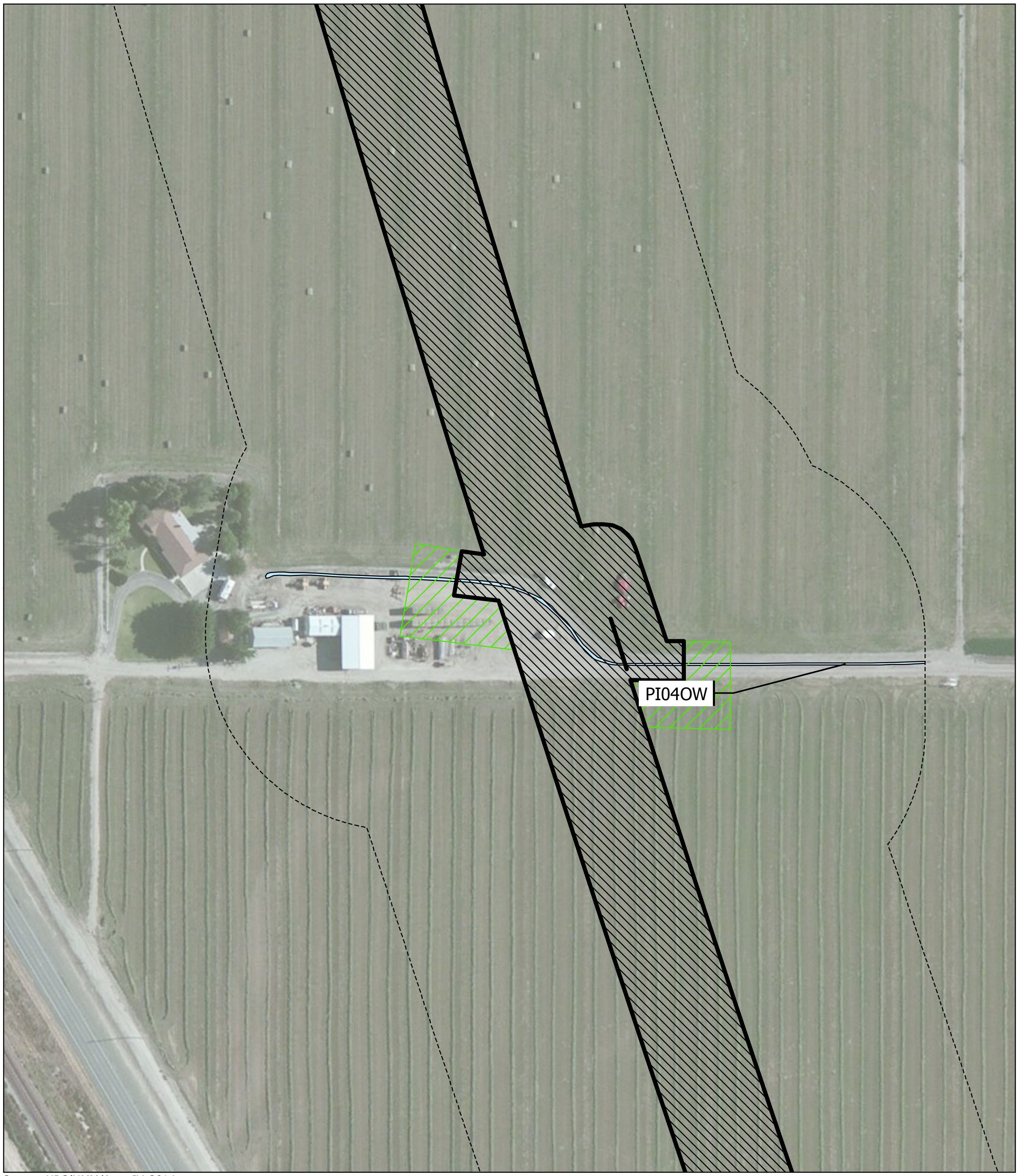

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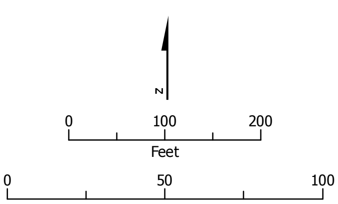

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
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Vernal Pools and Swales

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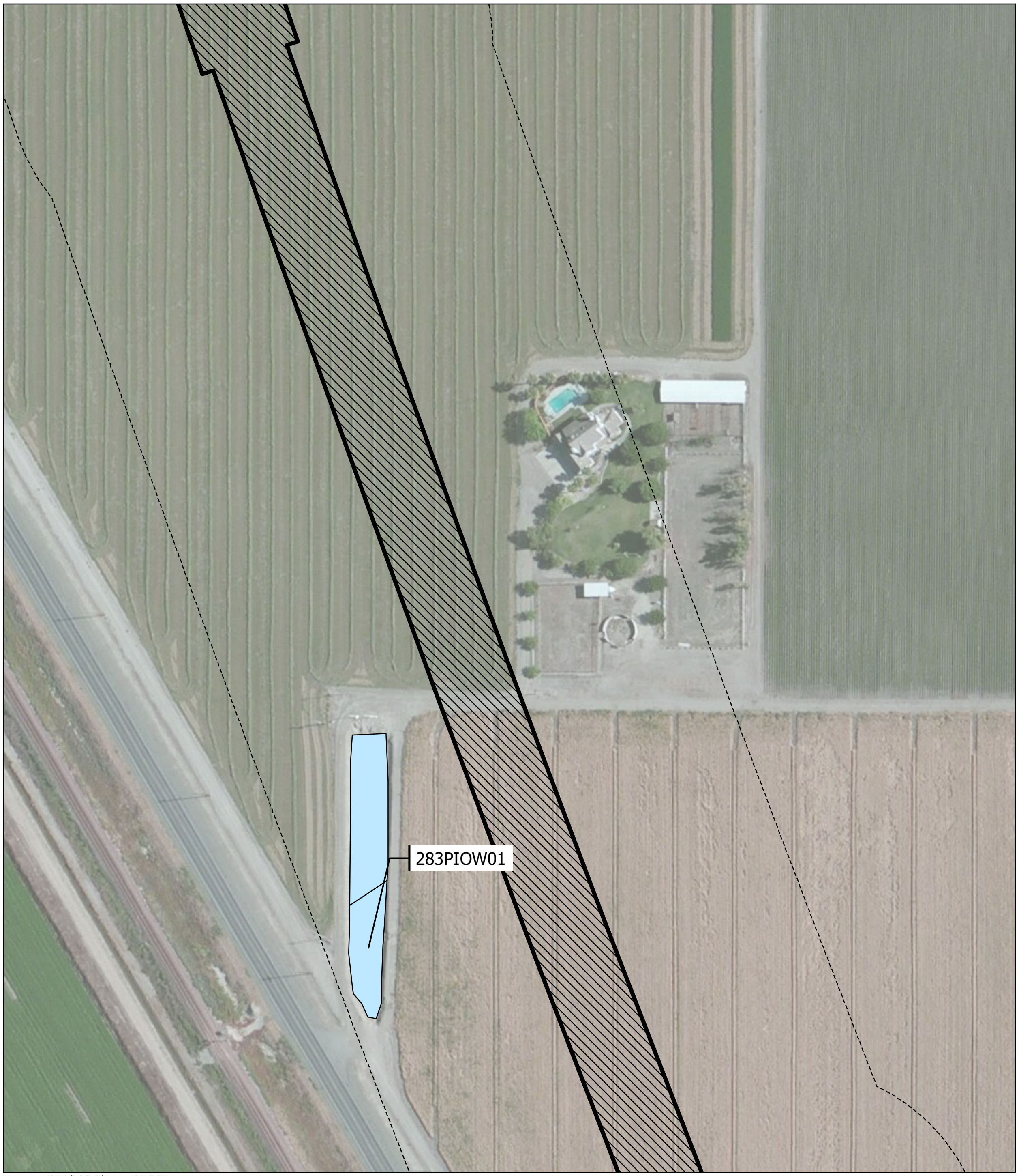

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250-ft BSA

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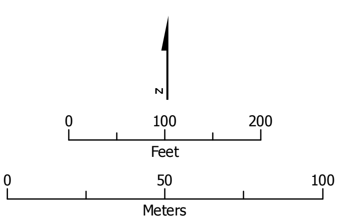

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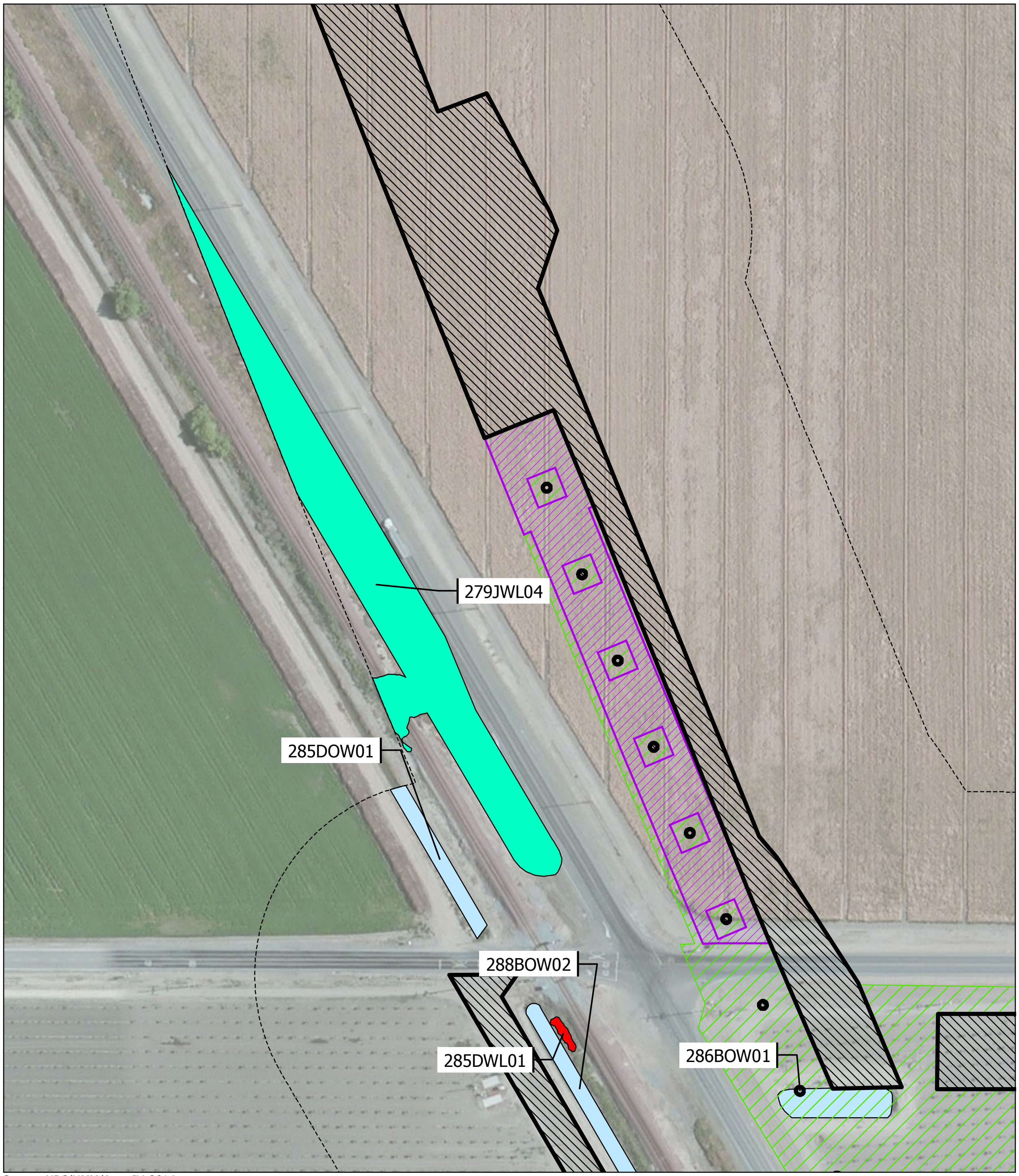

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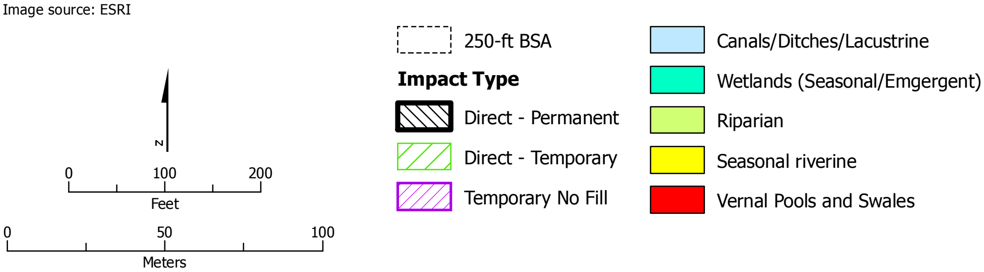

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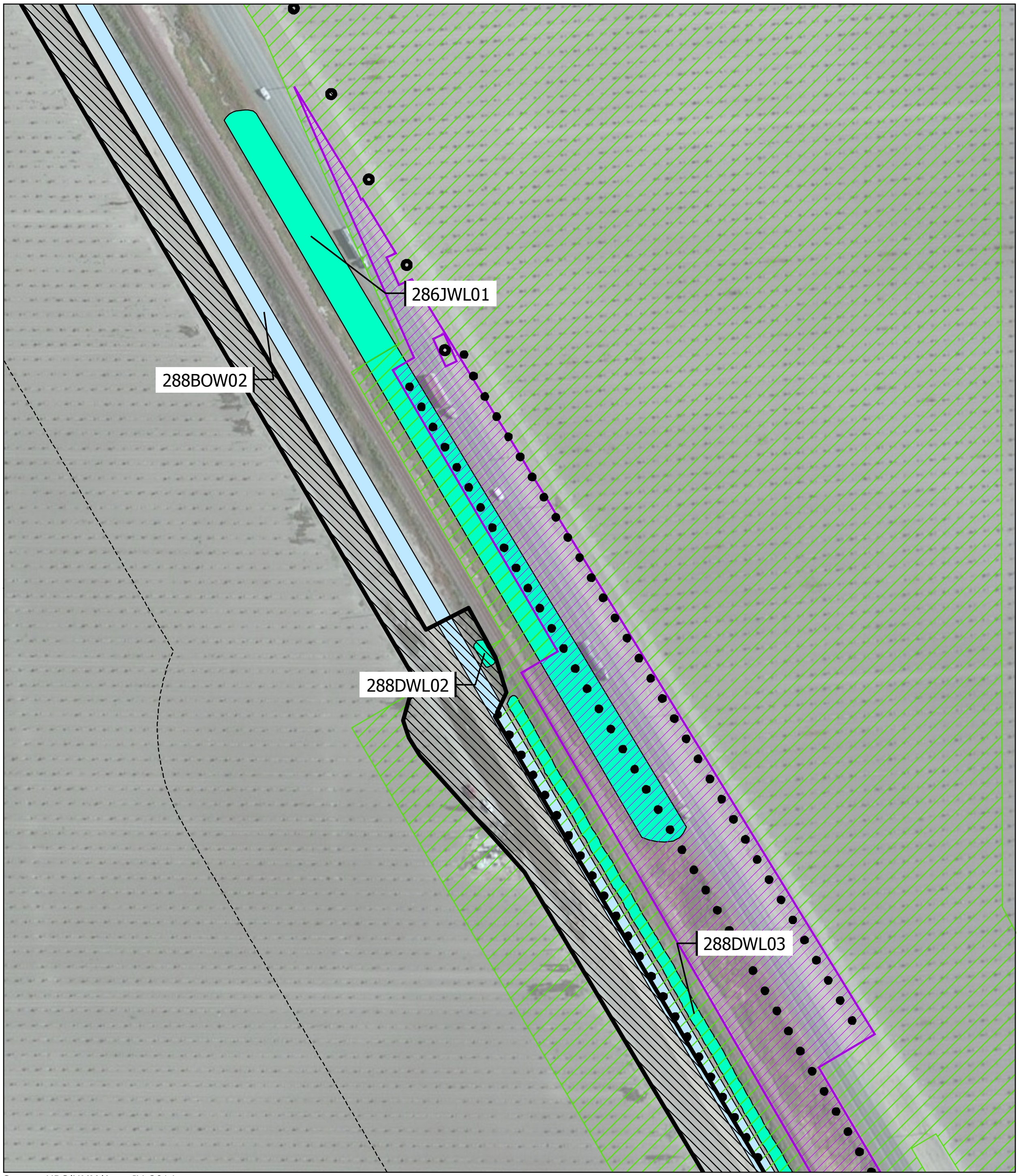

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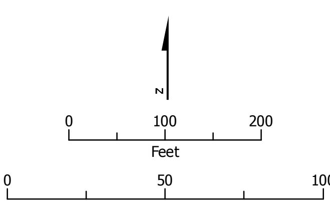

250-ft BSA

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Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

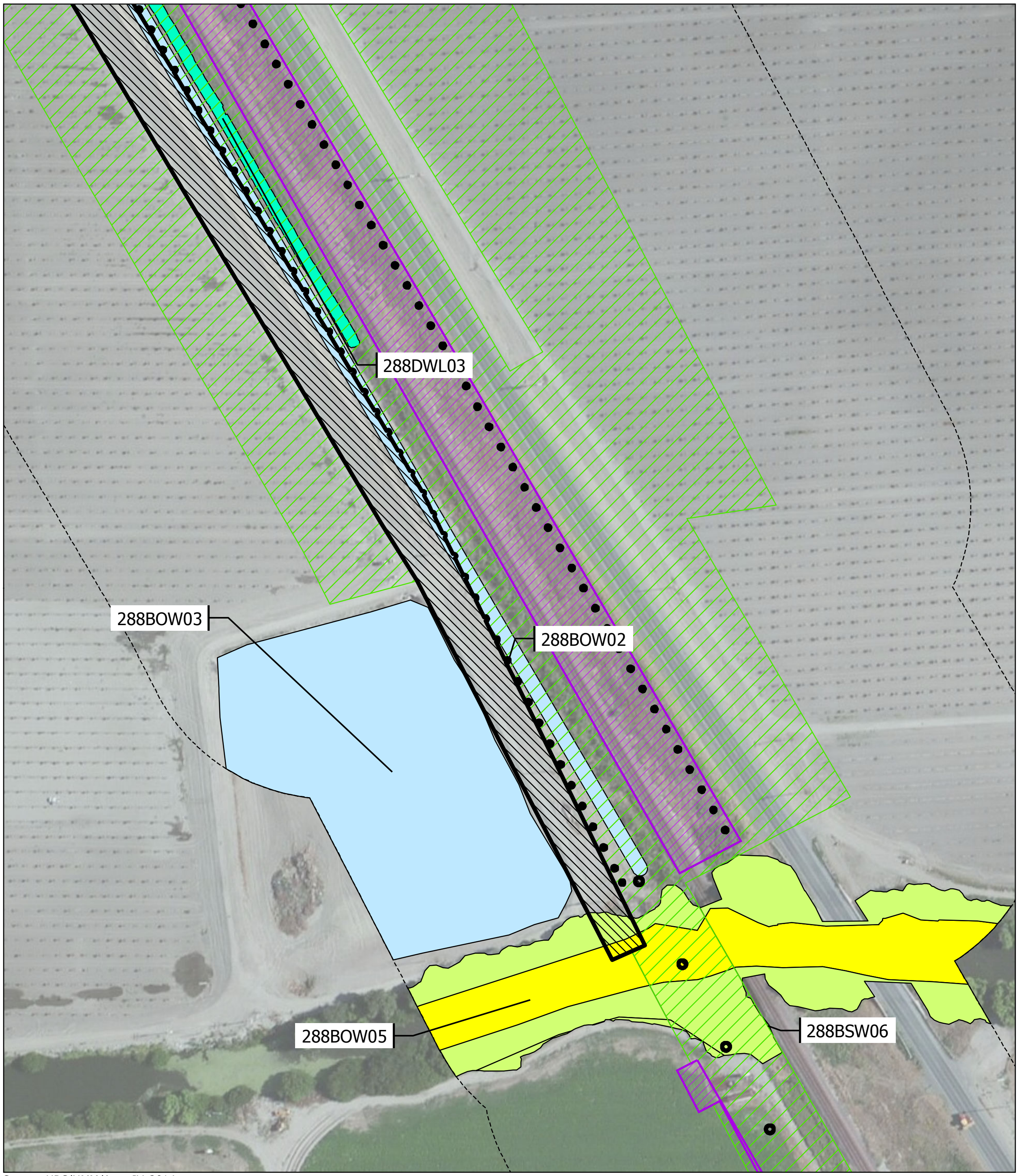
Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

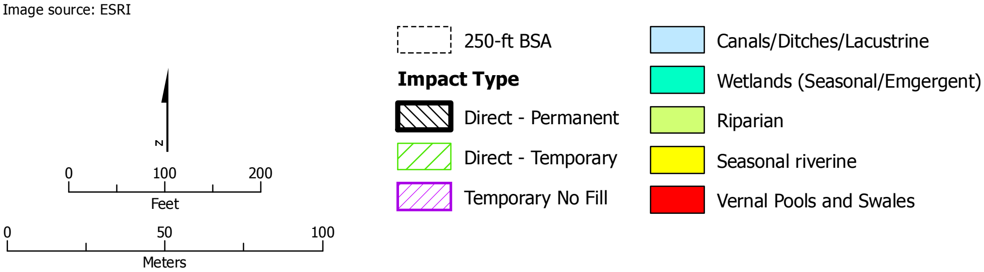
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

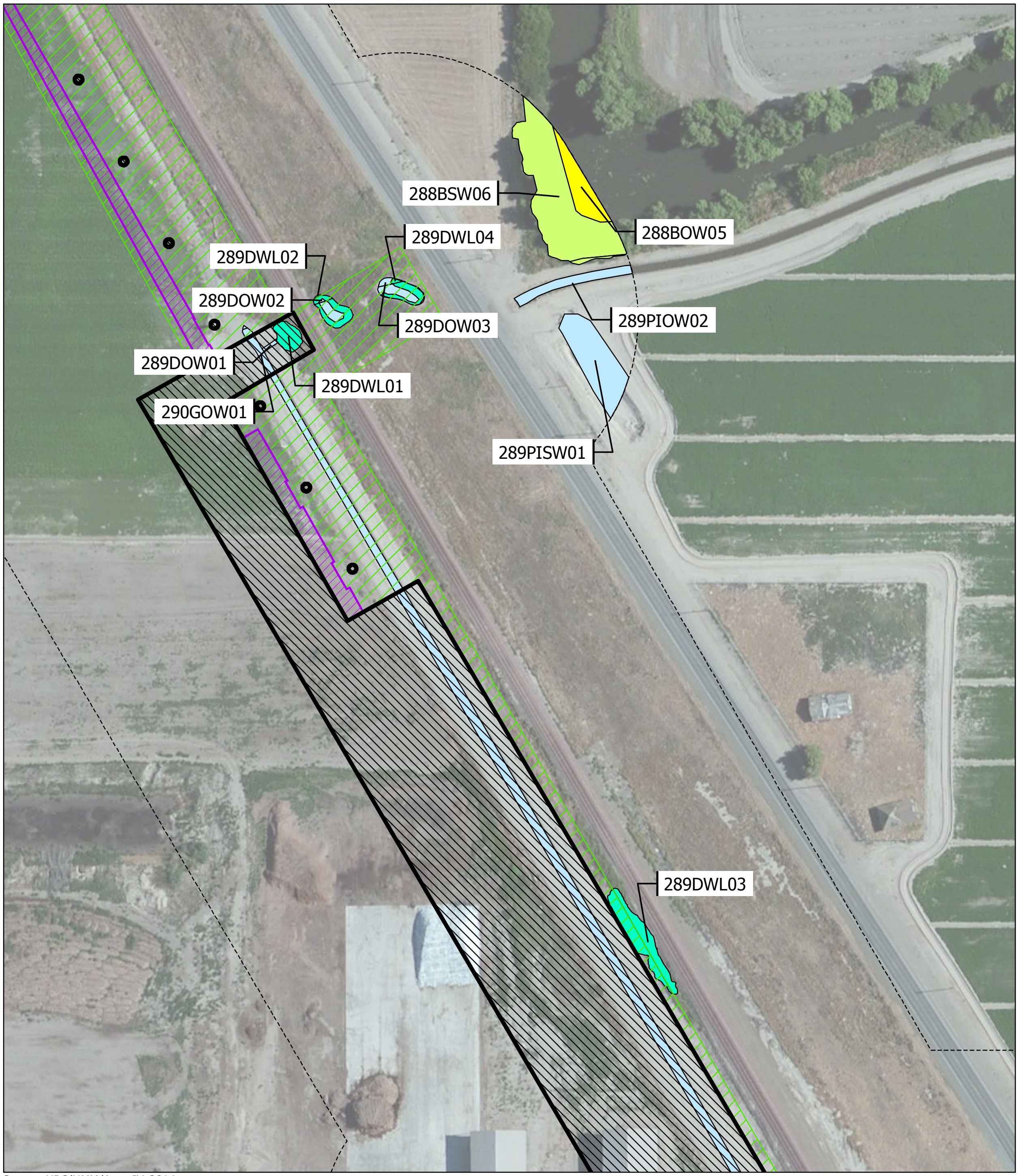


Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

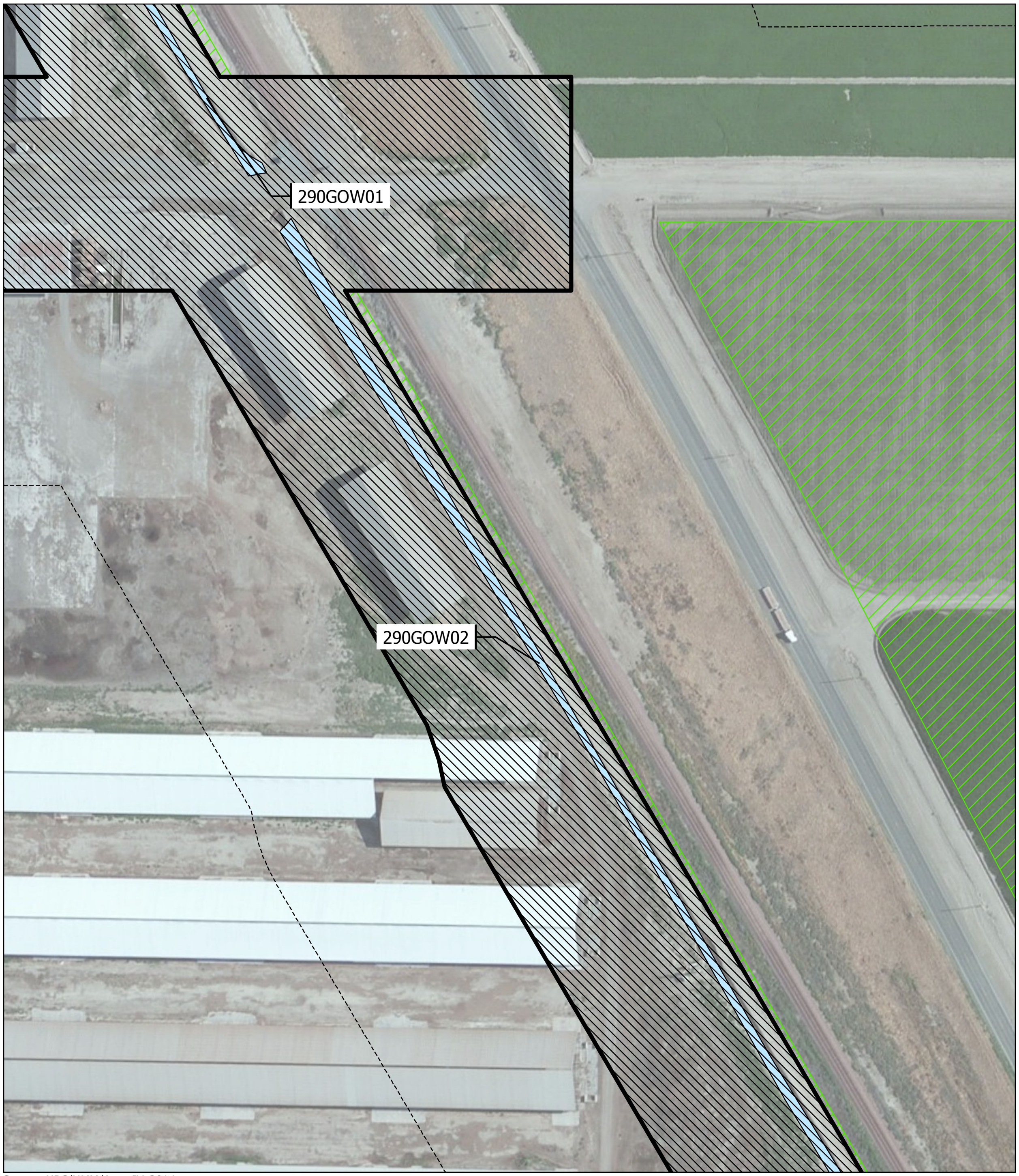
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

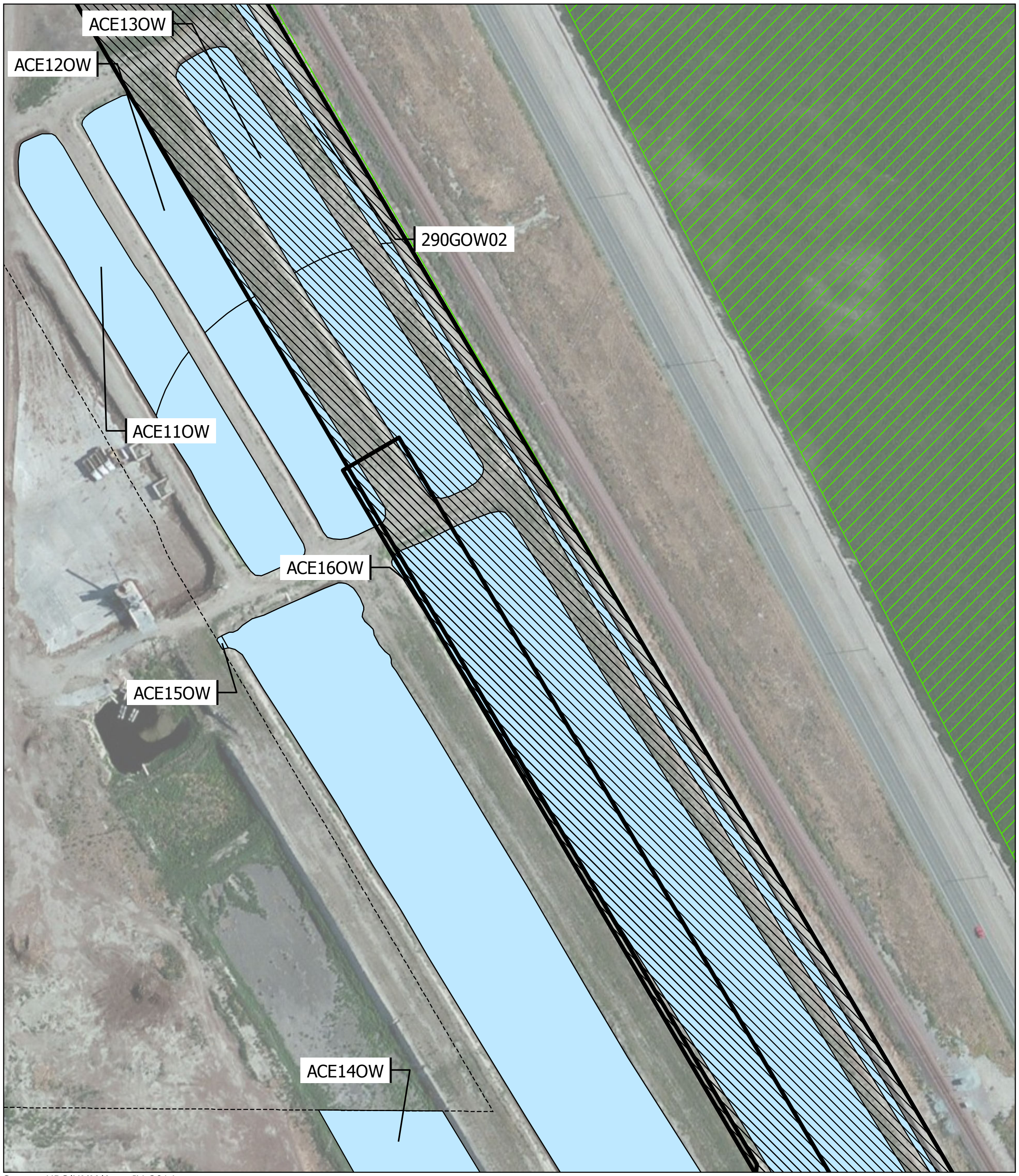


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

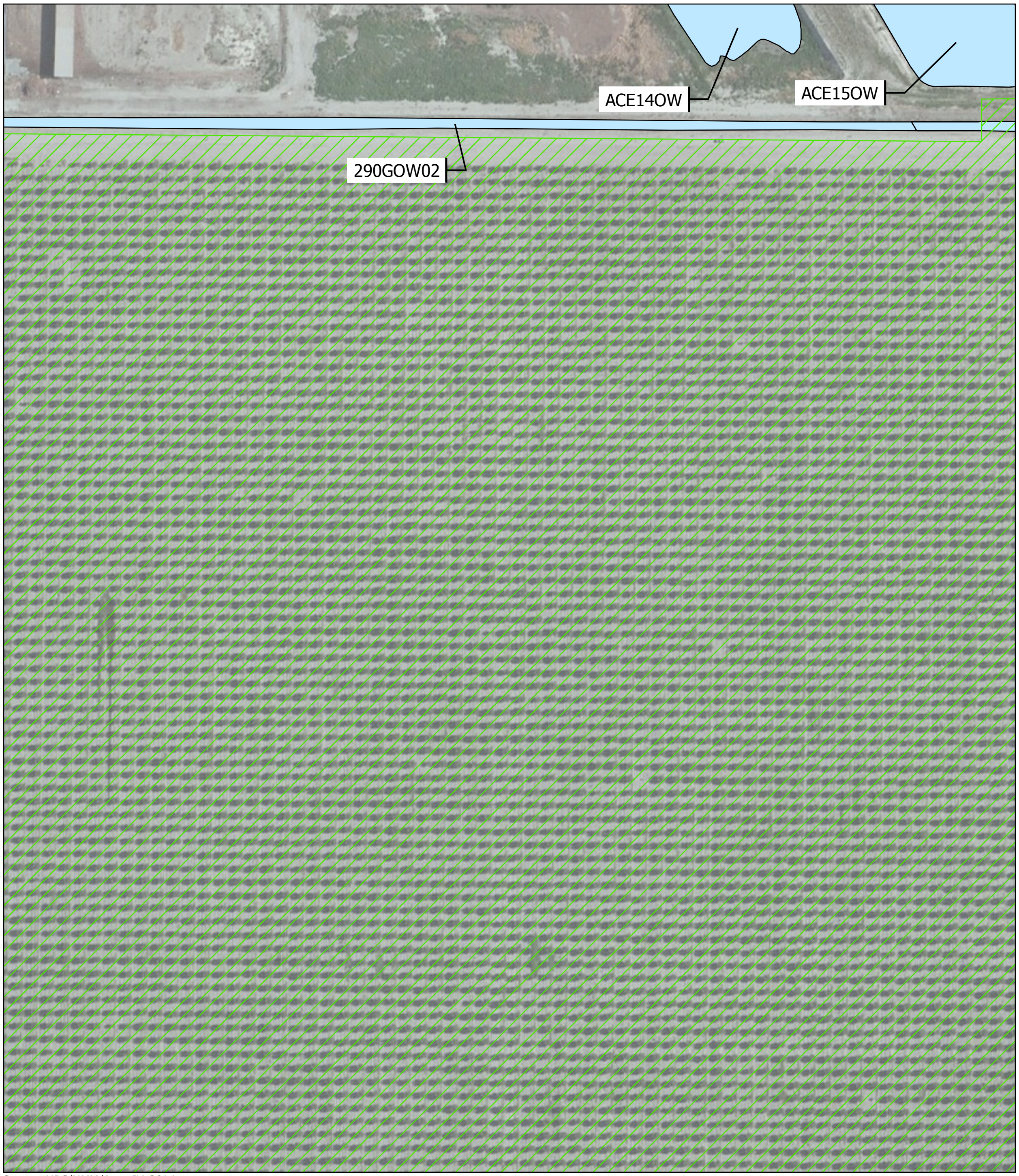
Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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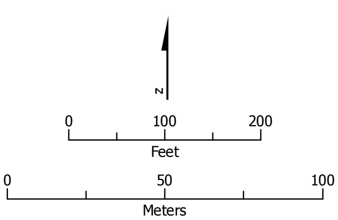

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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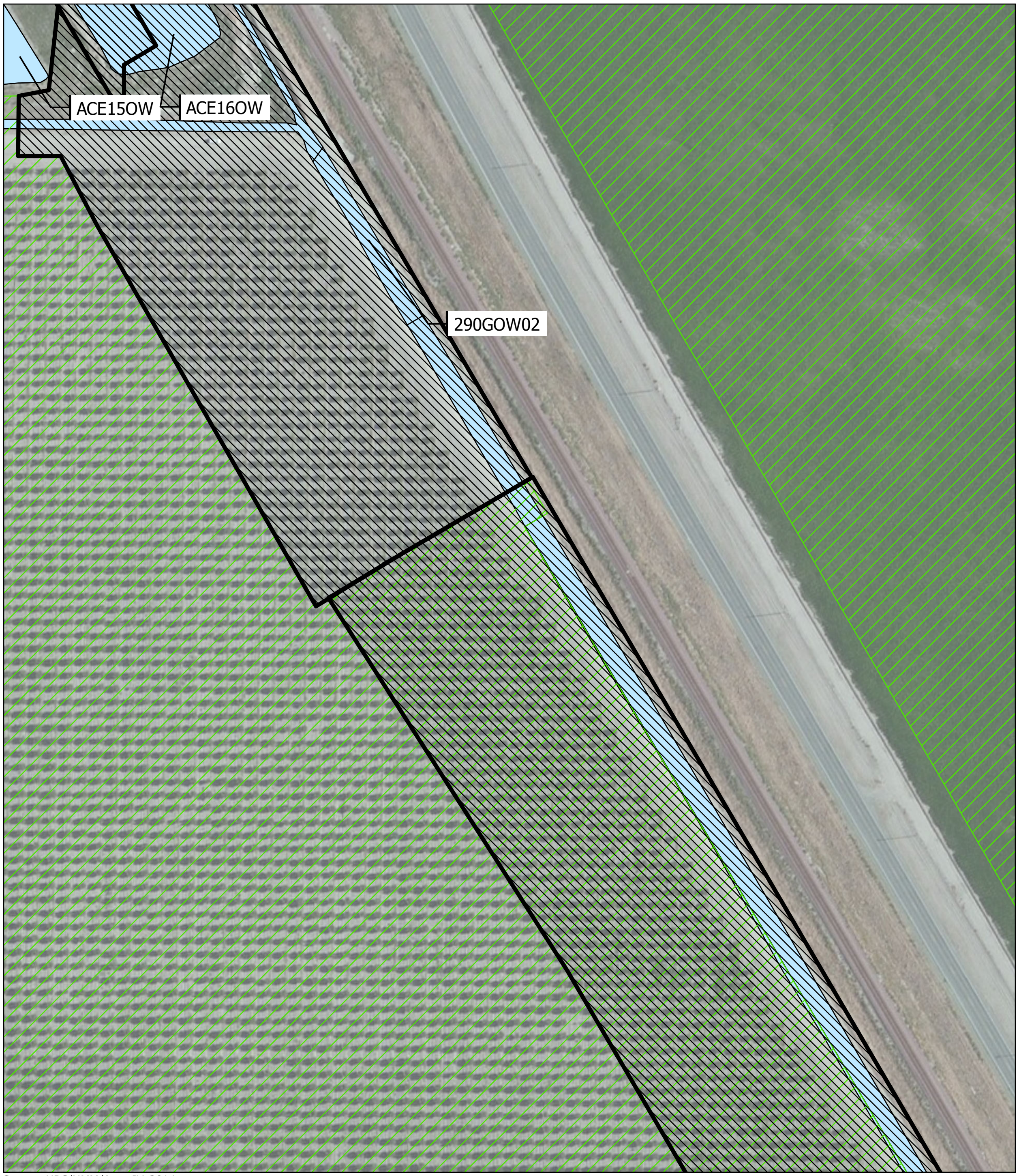

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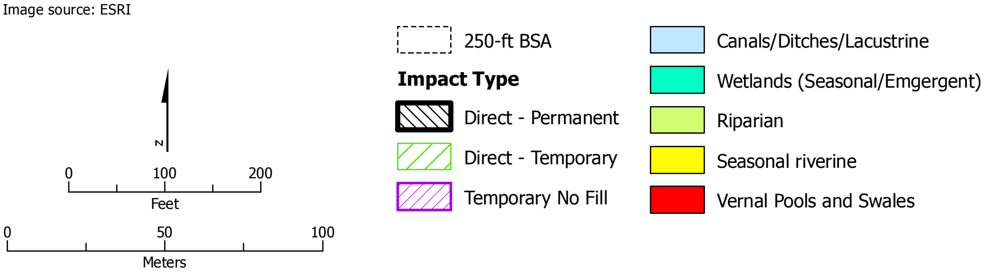
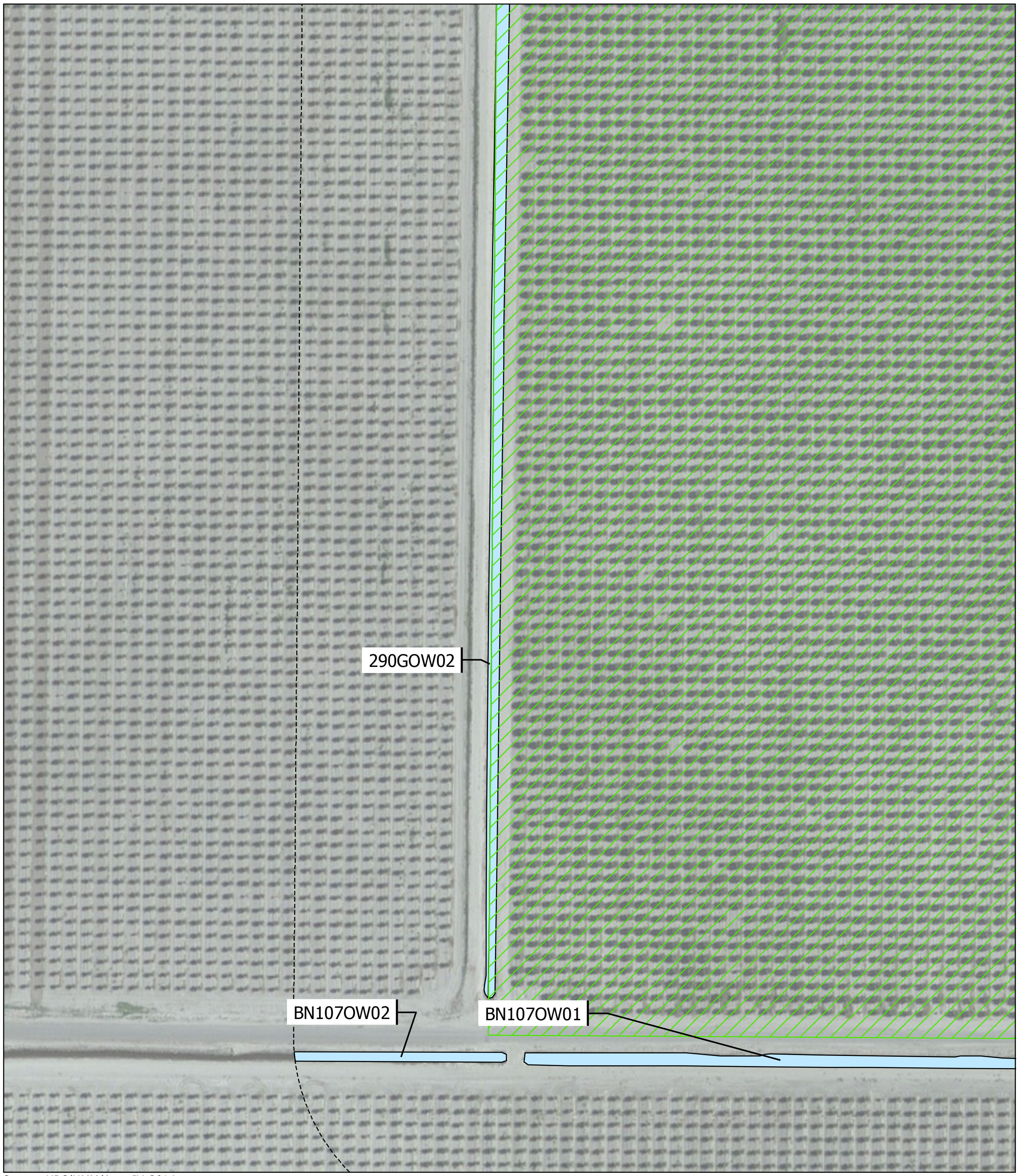


Appendix 4
Project Impact Mapbook



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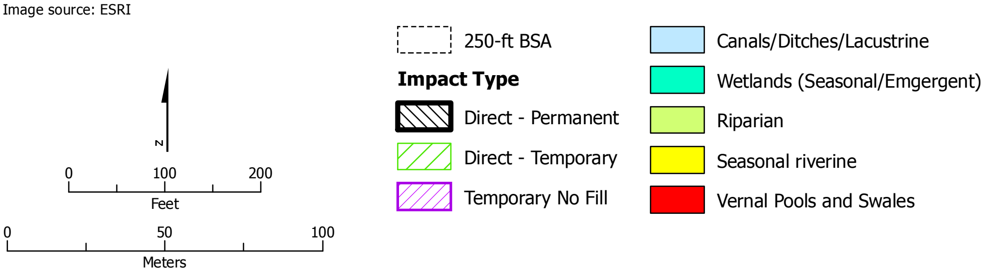

Appendix 4
Project Impact Mapbook

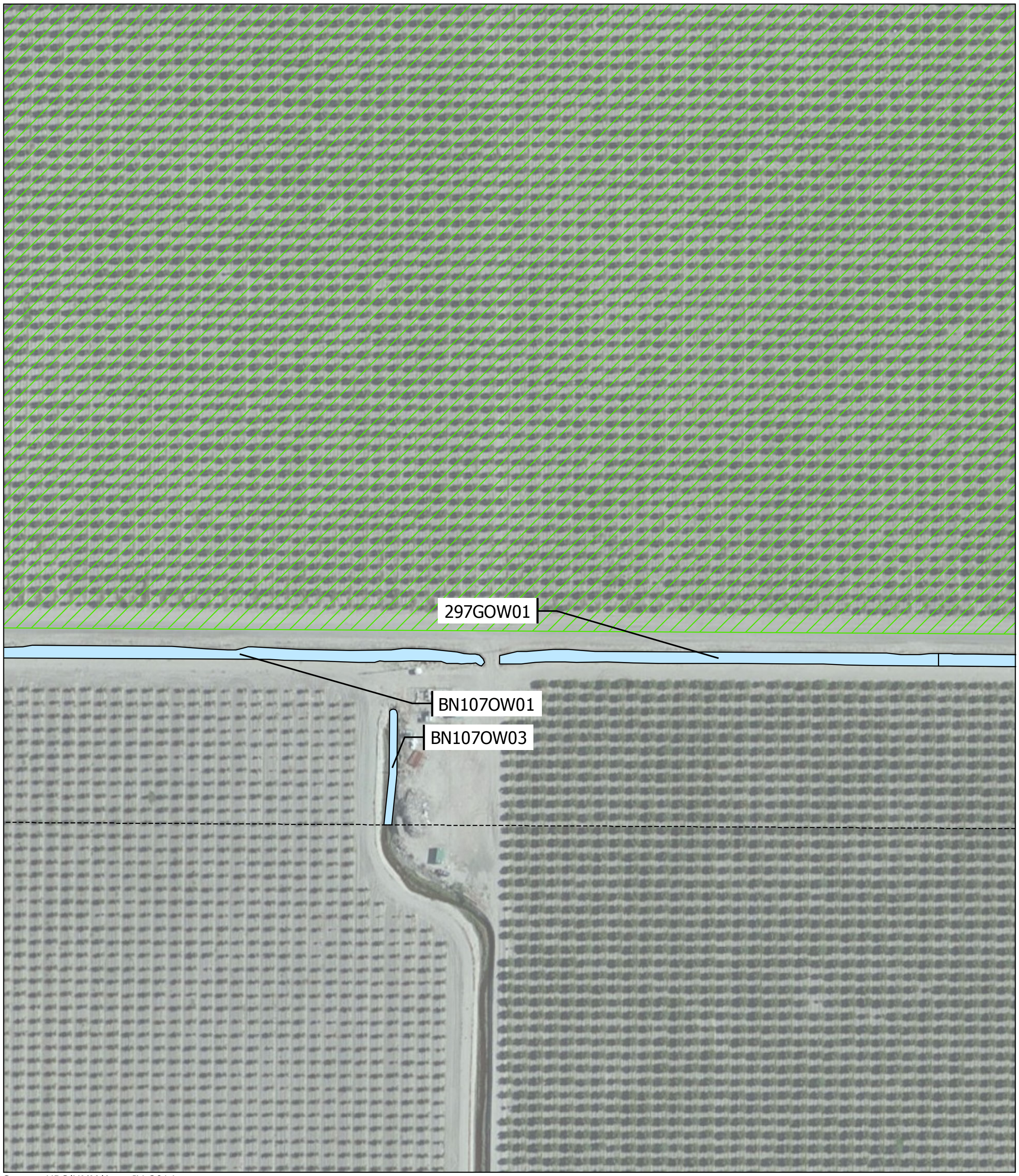

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

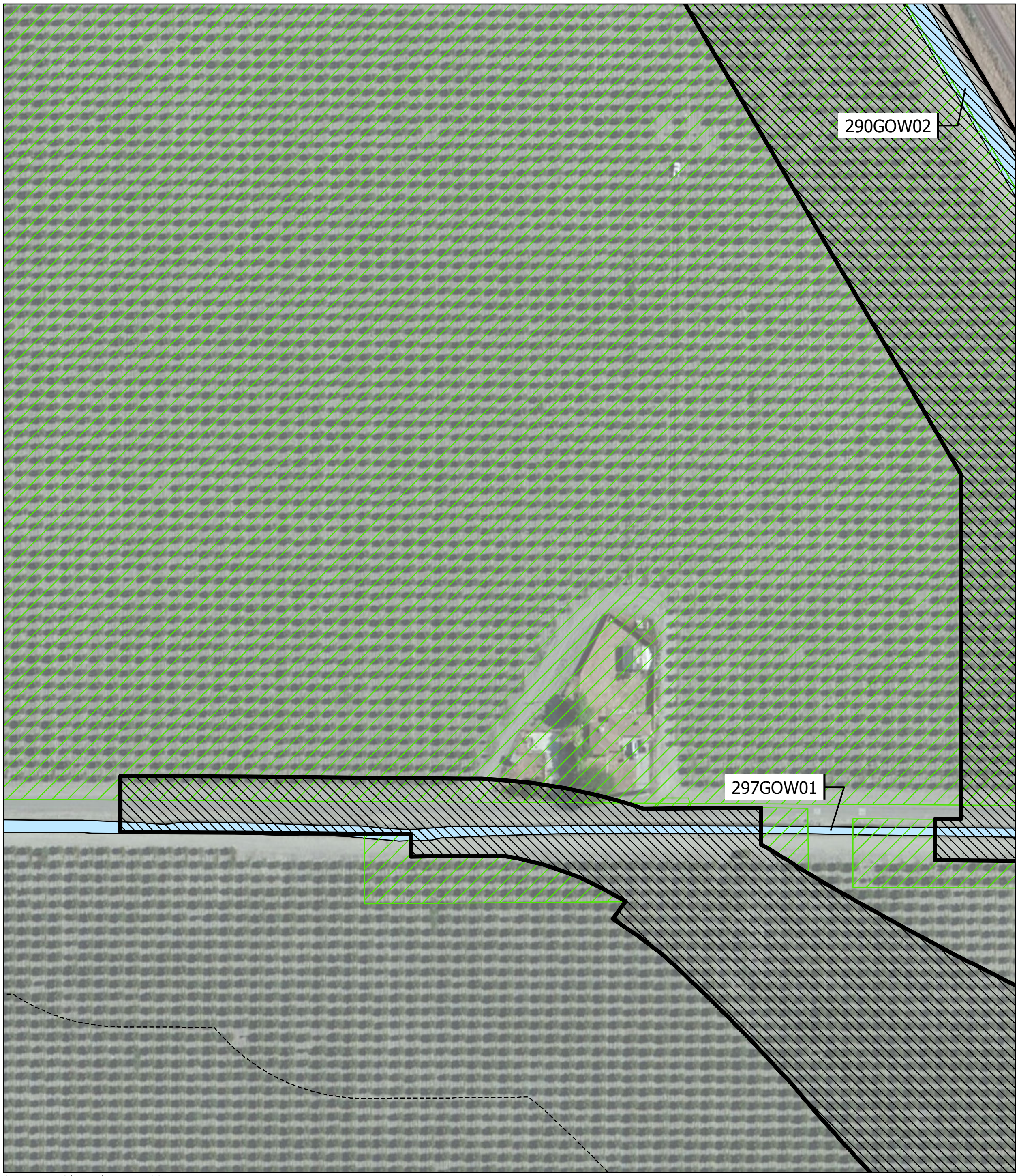
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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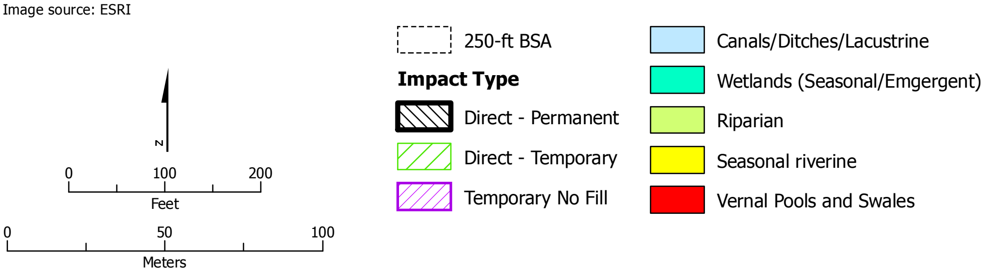
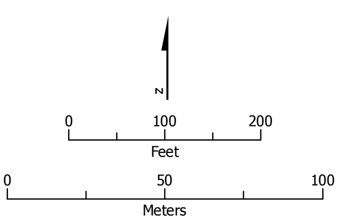


Appendix 4
Project Impact Mapbook
Page 130 of 246

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

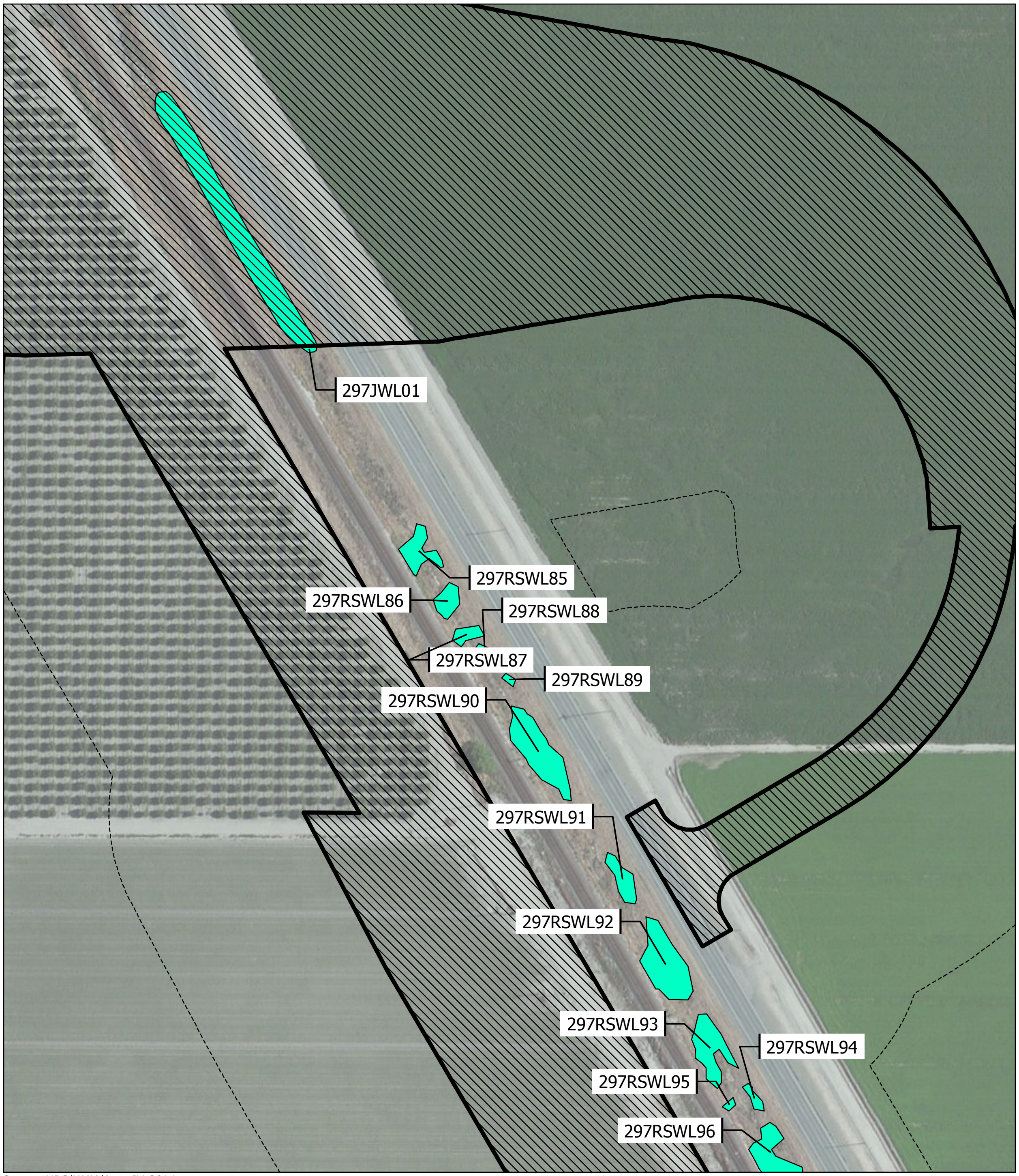
Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

CALIFORNIA High-Speed Rail Authority
U.S. Department of Transportation Federal Railroad Administration



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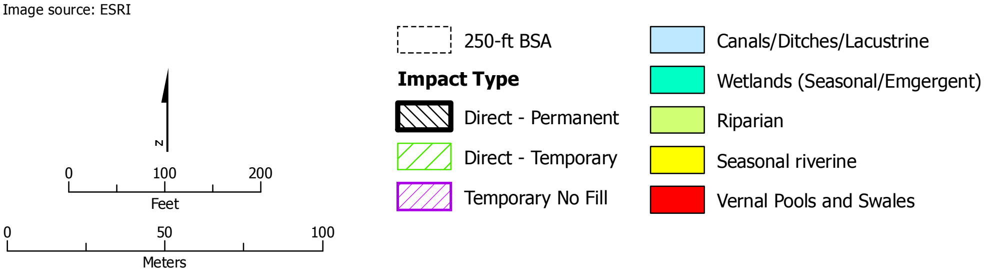

Appendix 4
Project Impact Mapbook

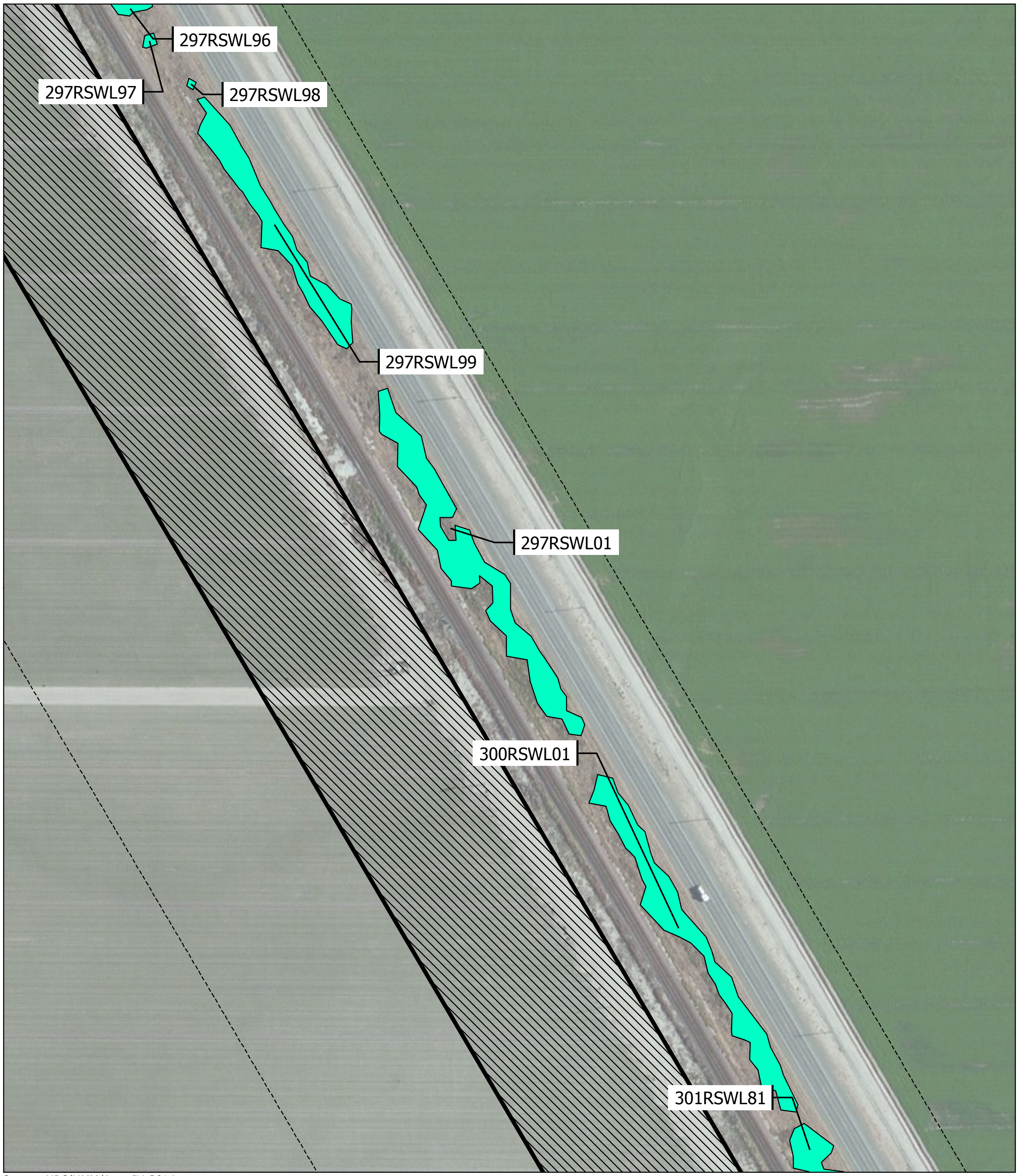

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

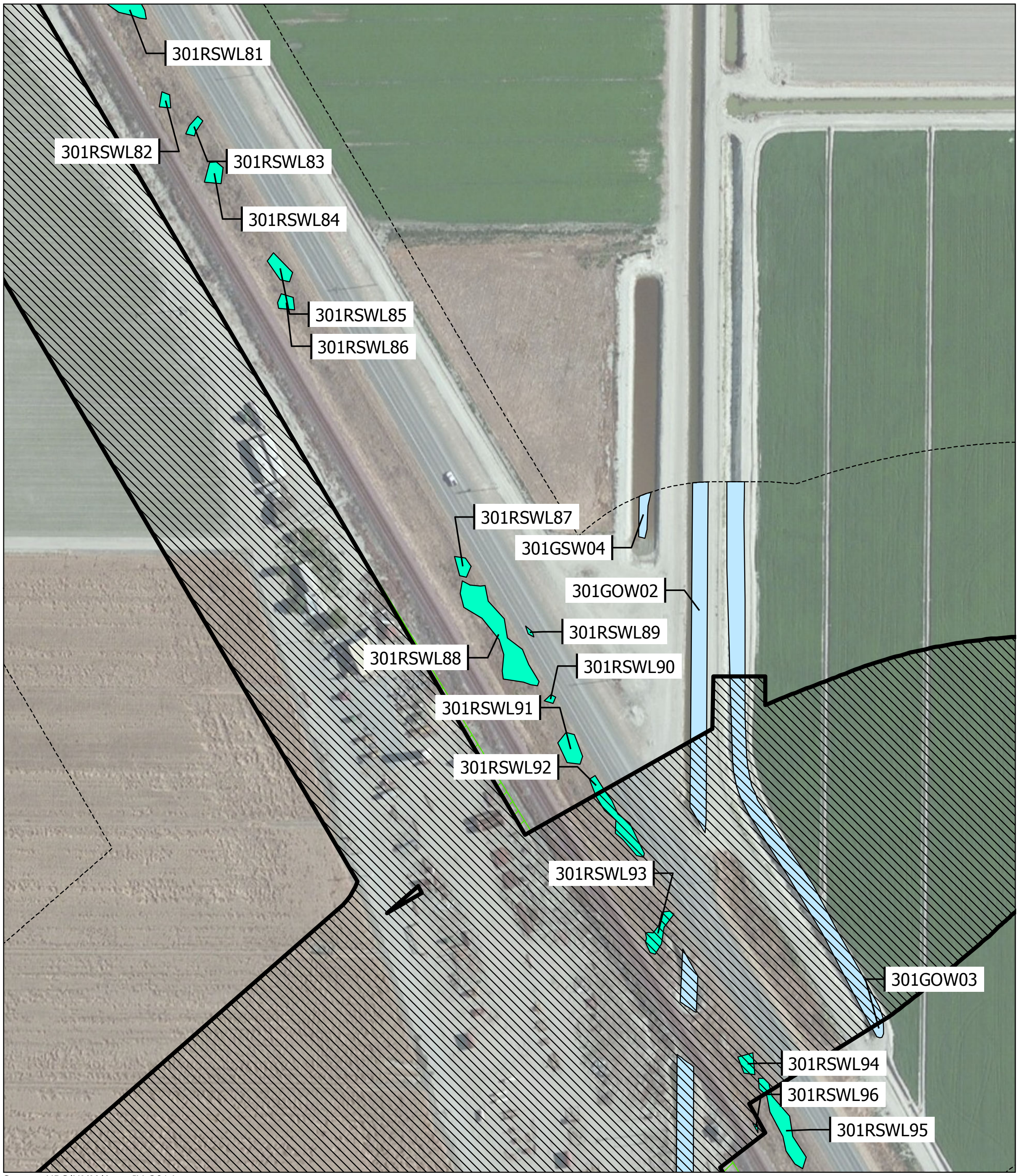
Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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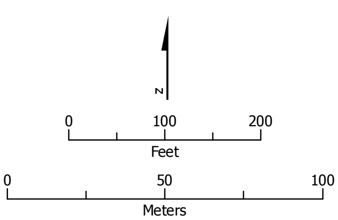

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

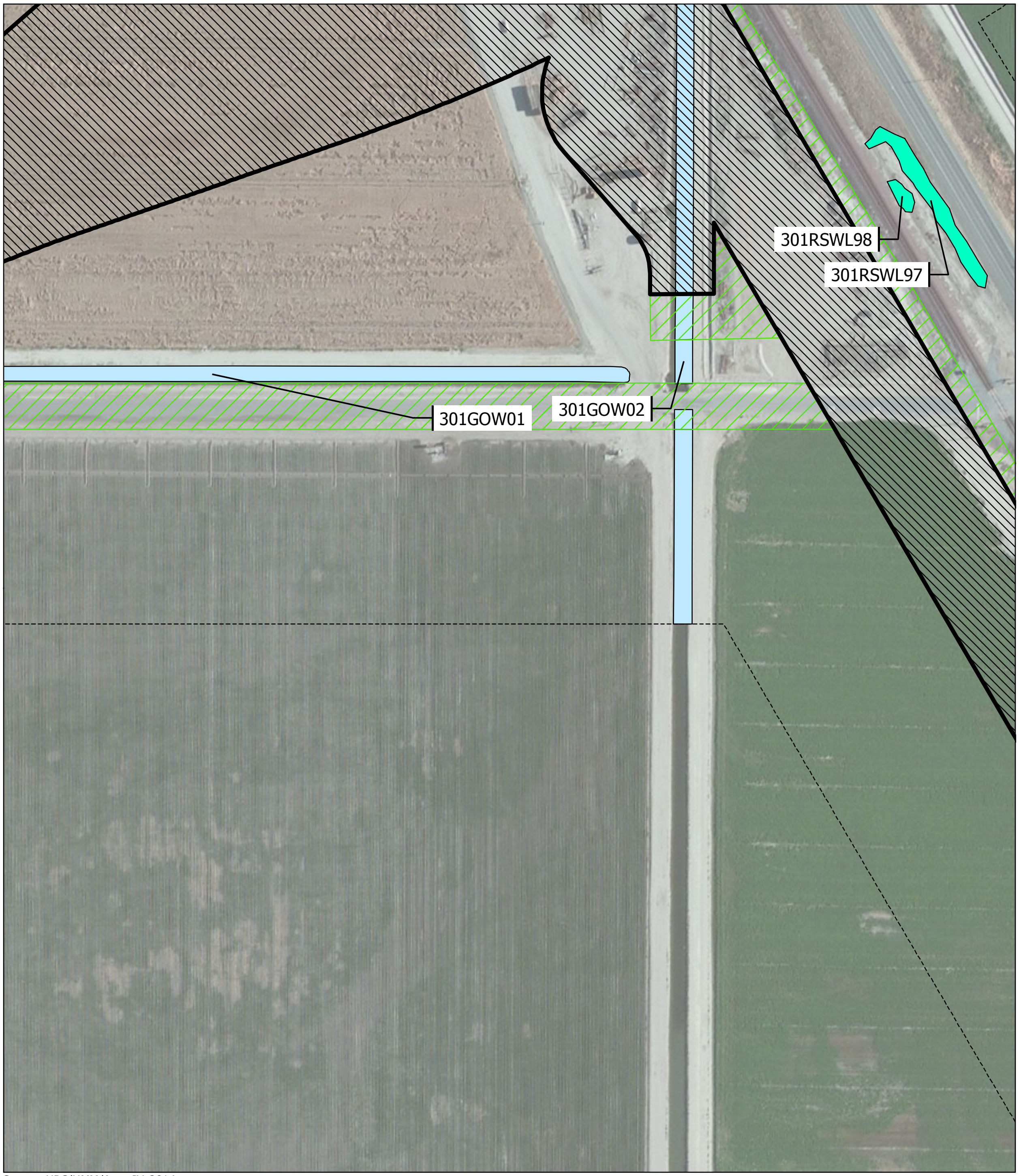

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

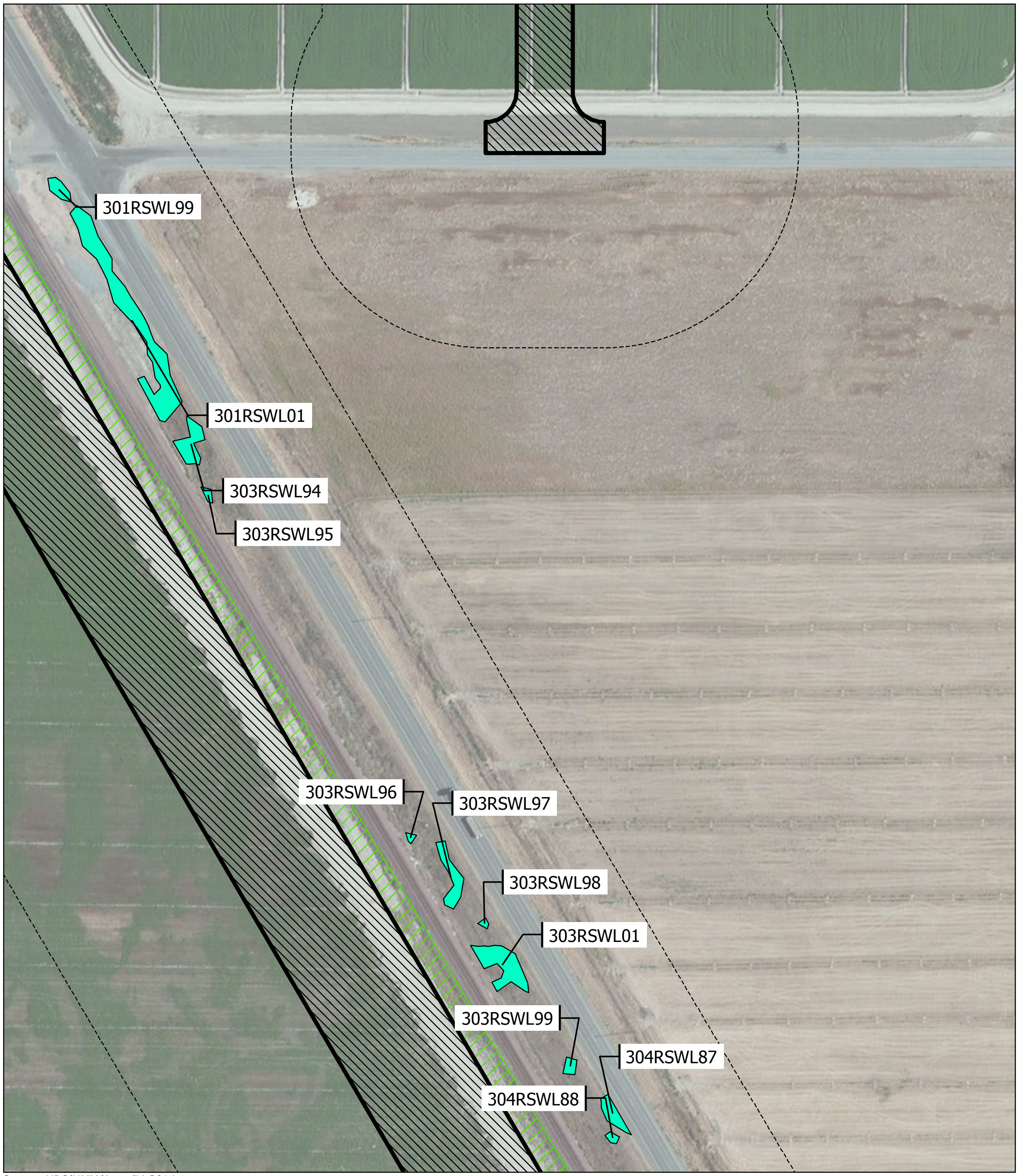
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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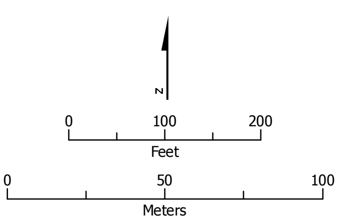

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

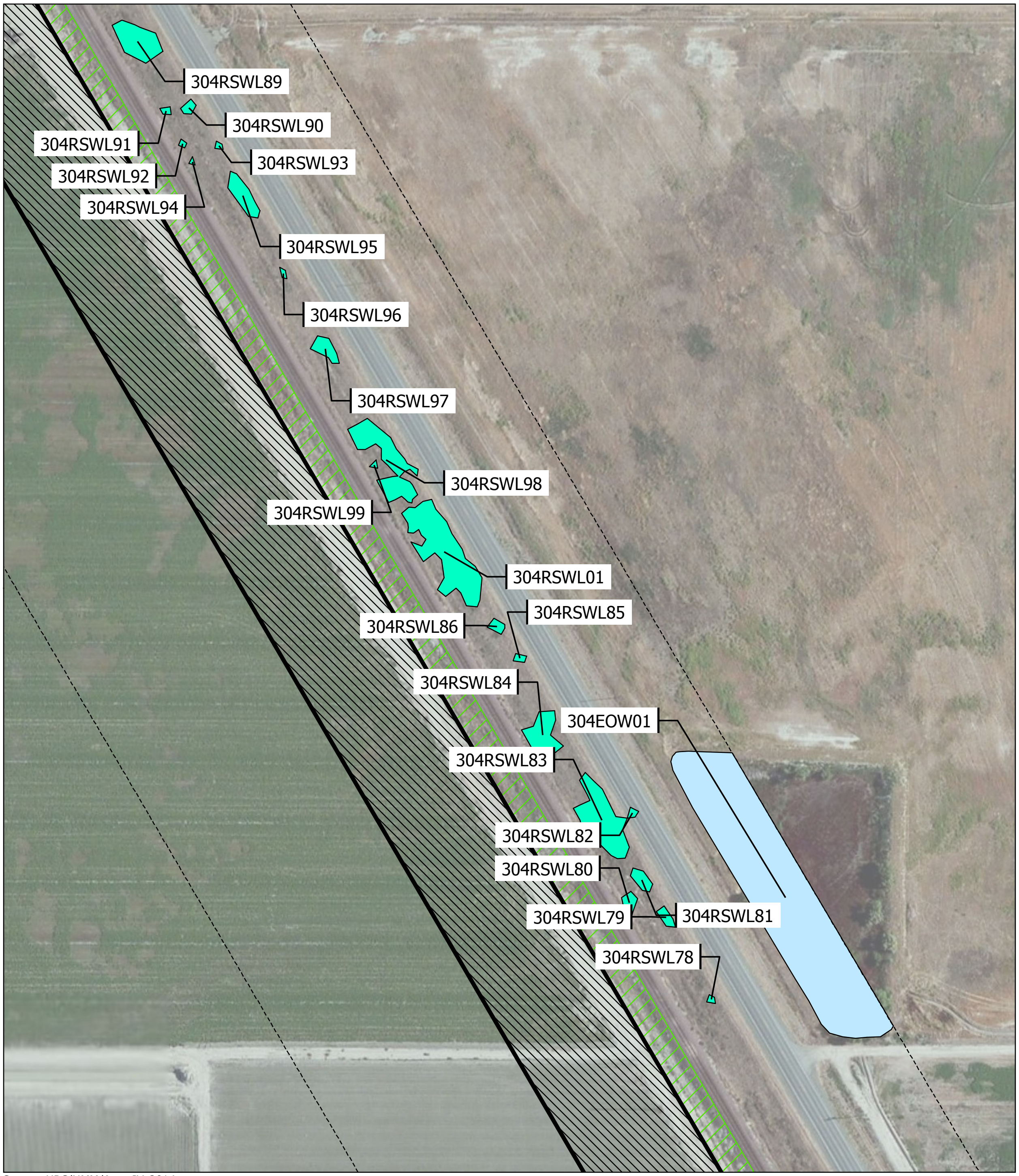

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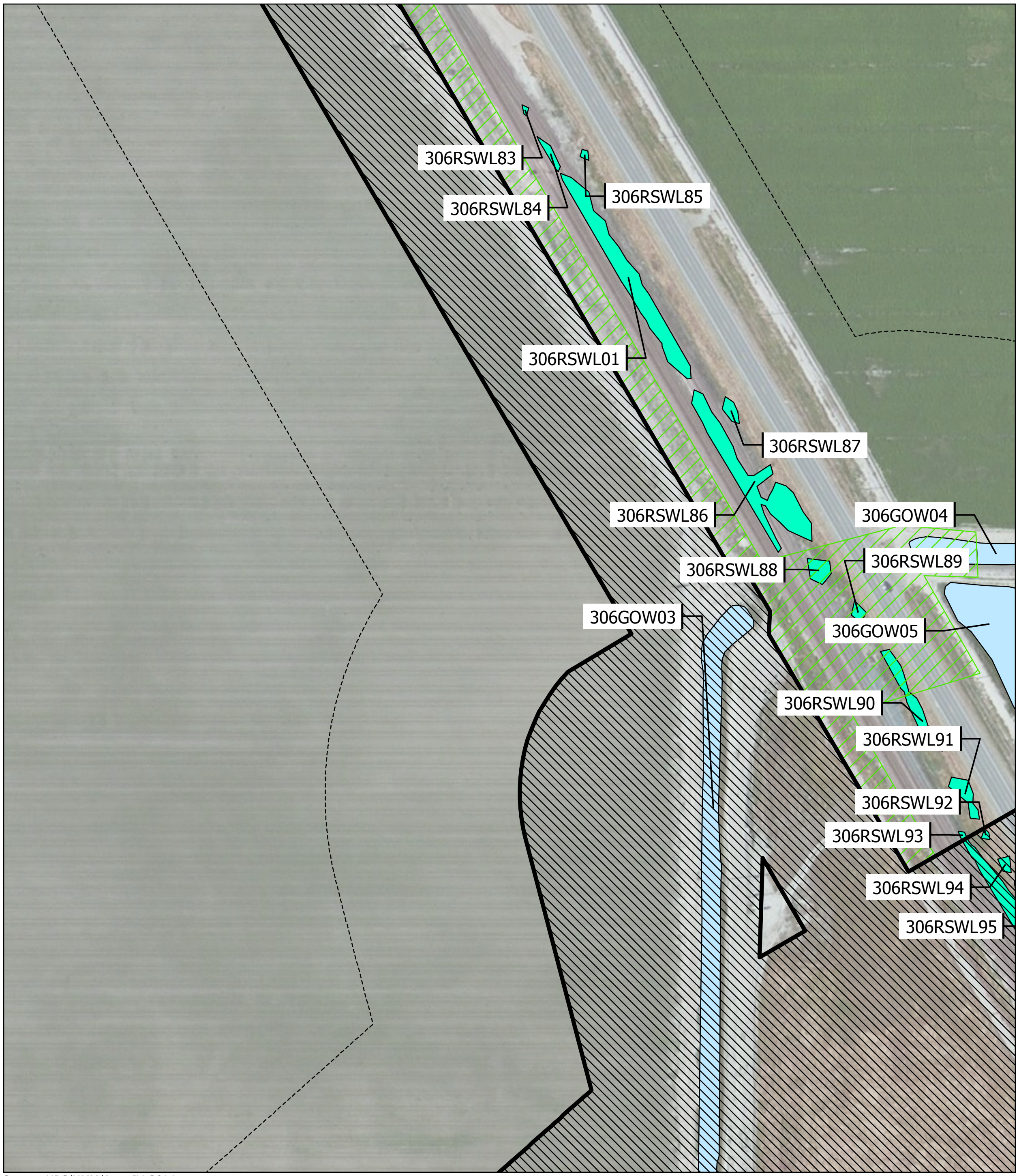
Image source: ESRI

January 22, 2014

Appendix 4
Project Impact Mapbook



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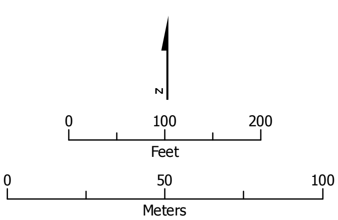
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

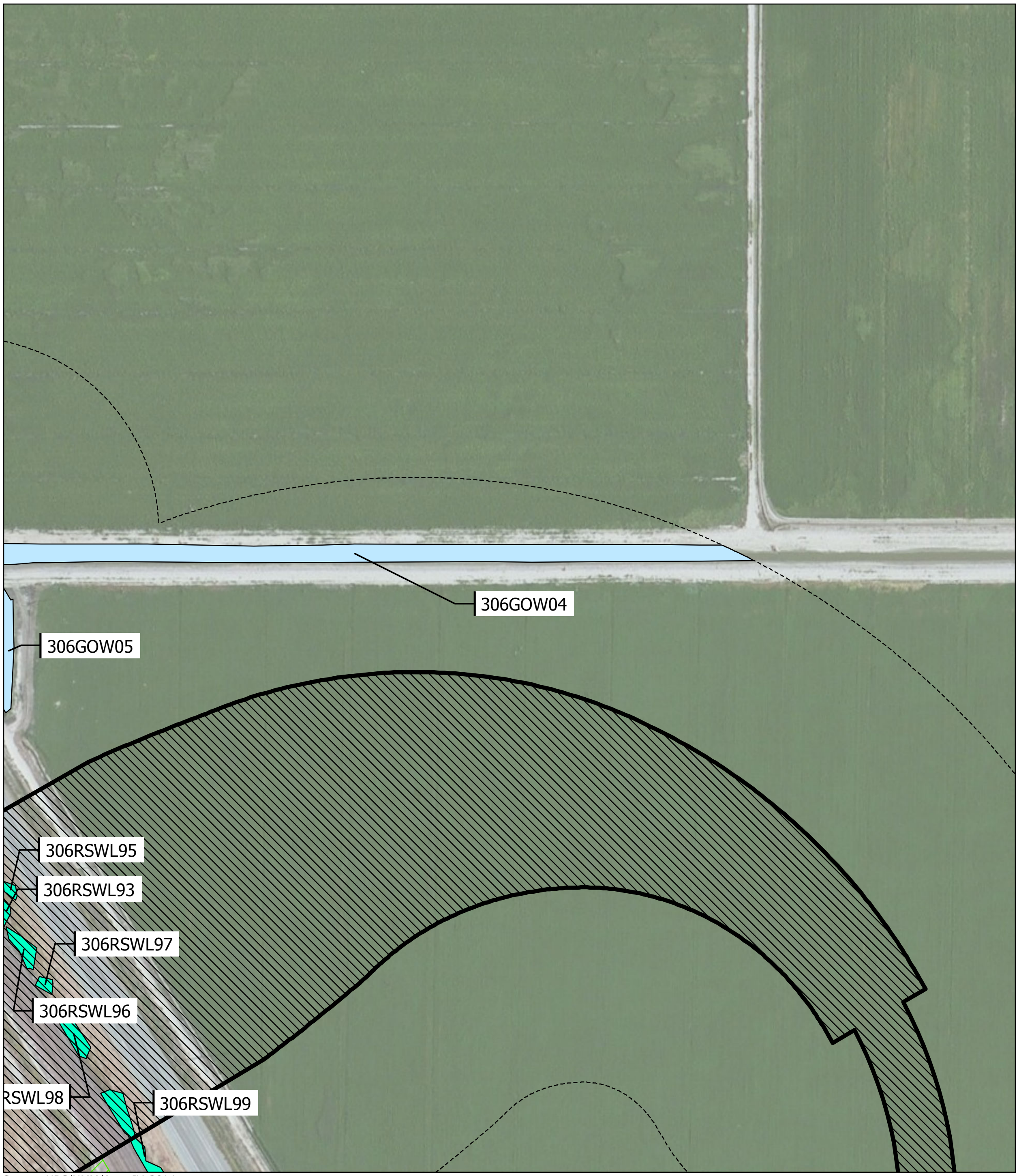


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

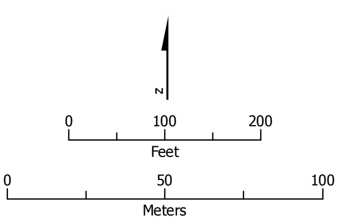
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
Page 140 of 246

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



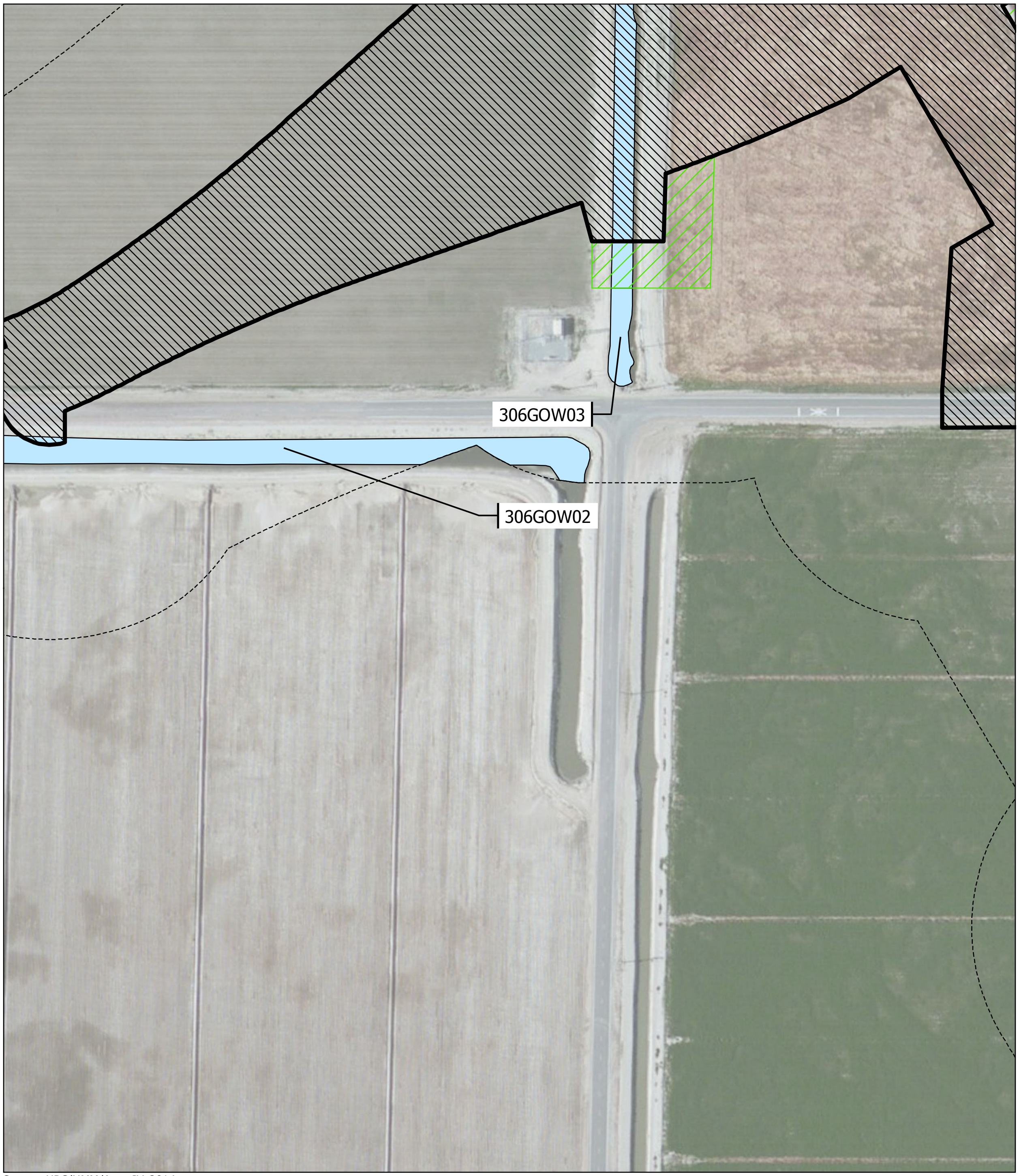
250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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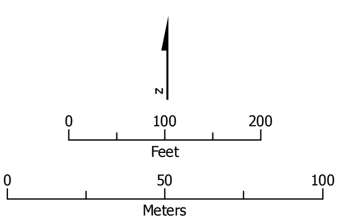
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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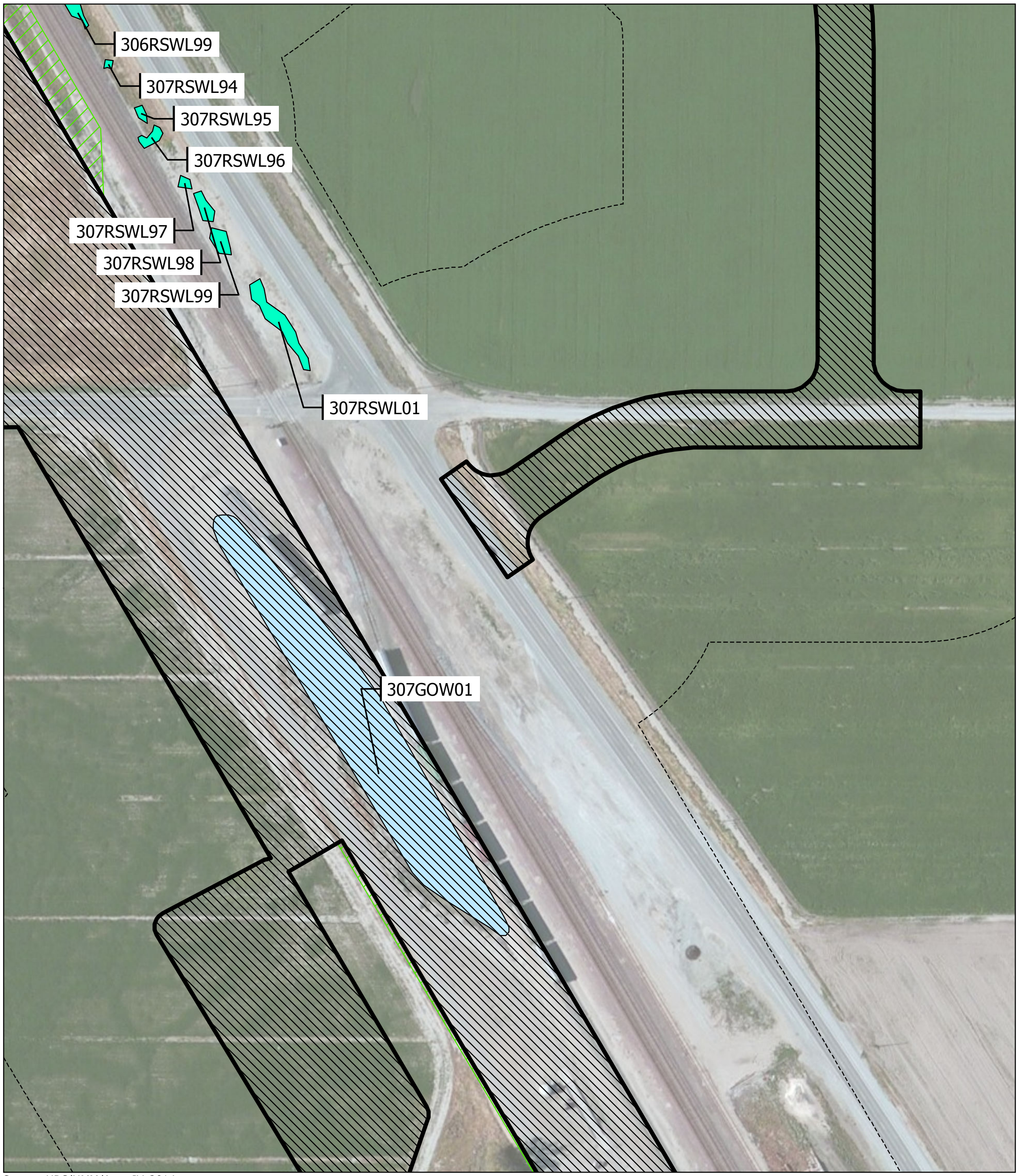

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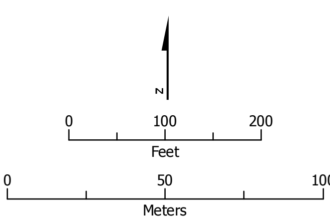


250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
Page 143 of 246

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

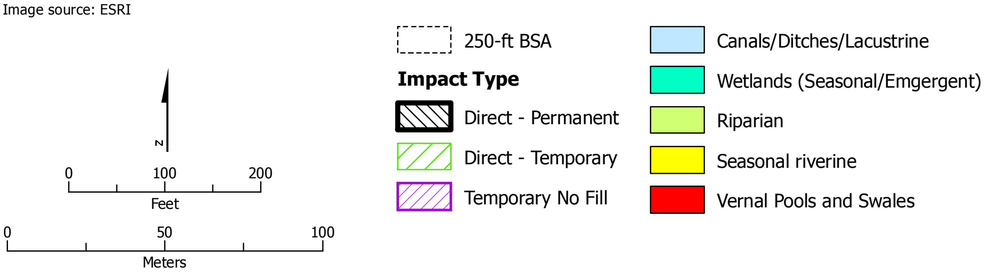
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

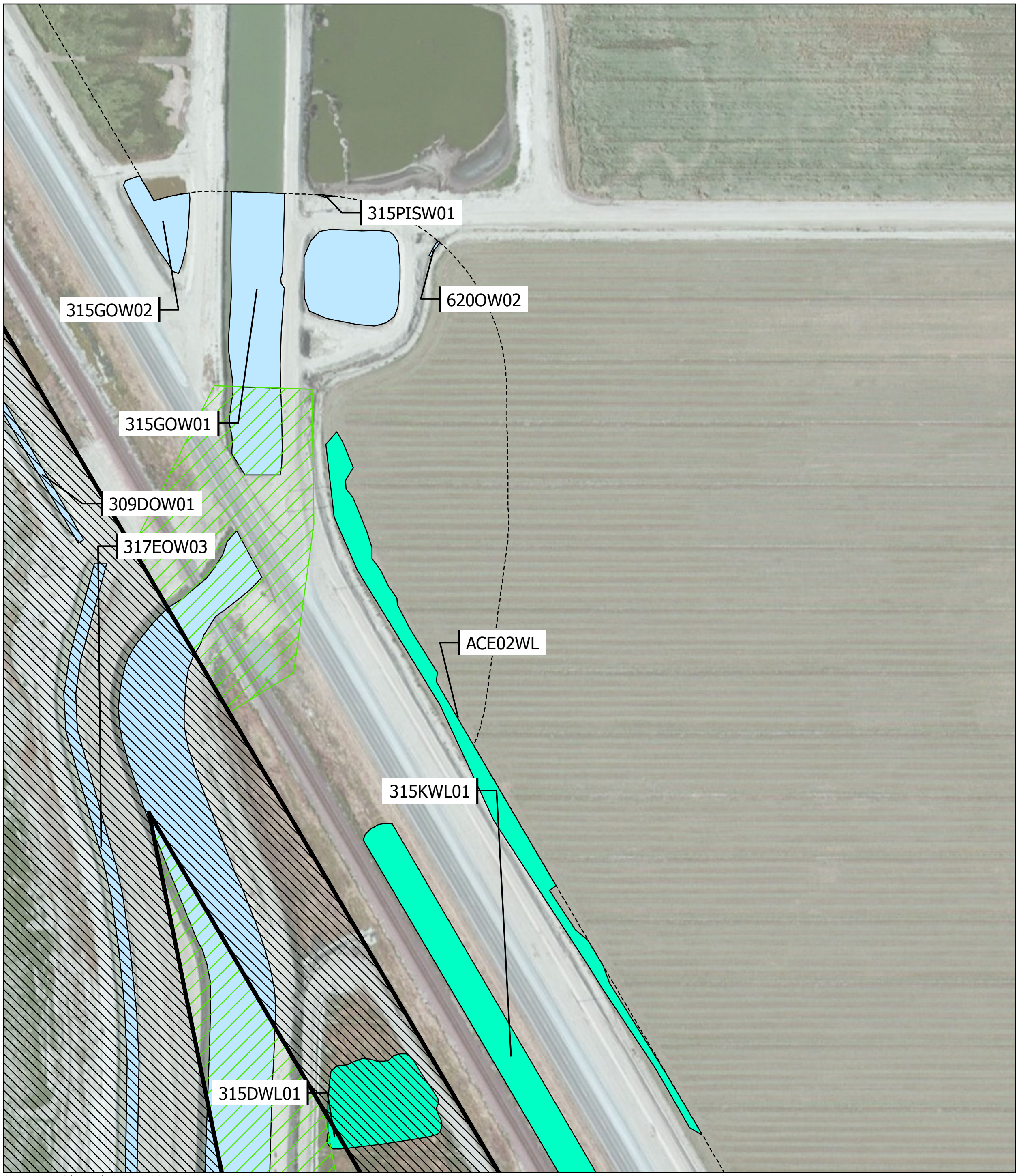
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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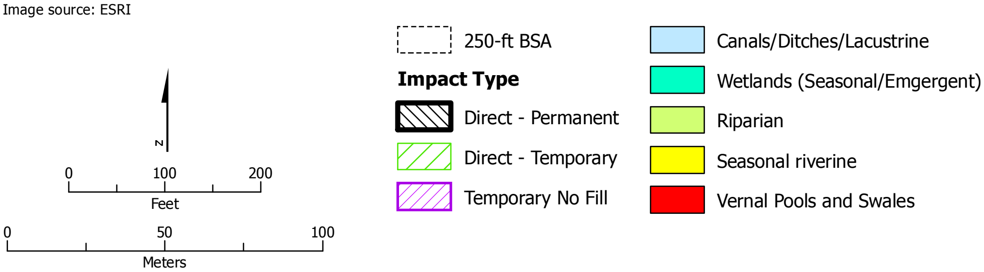

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Project Impact Mapbook
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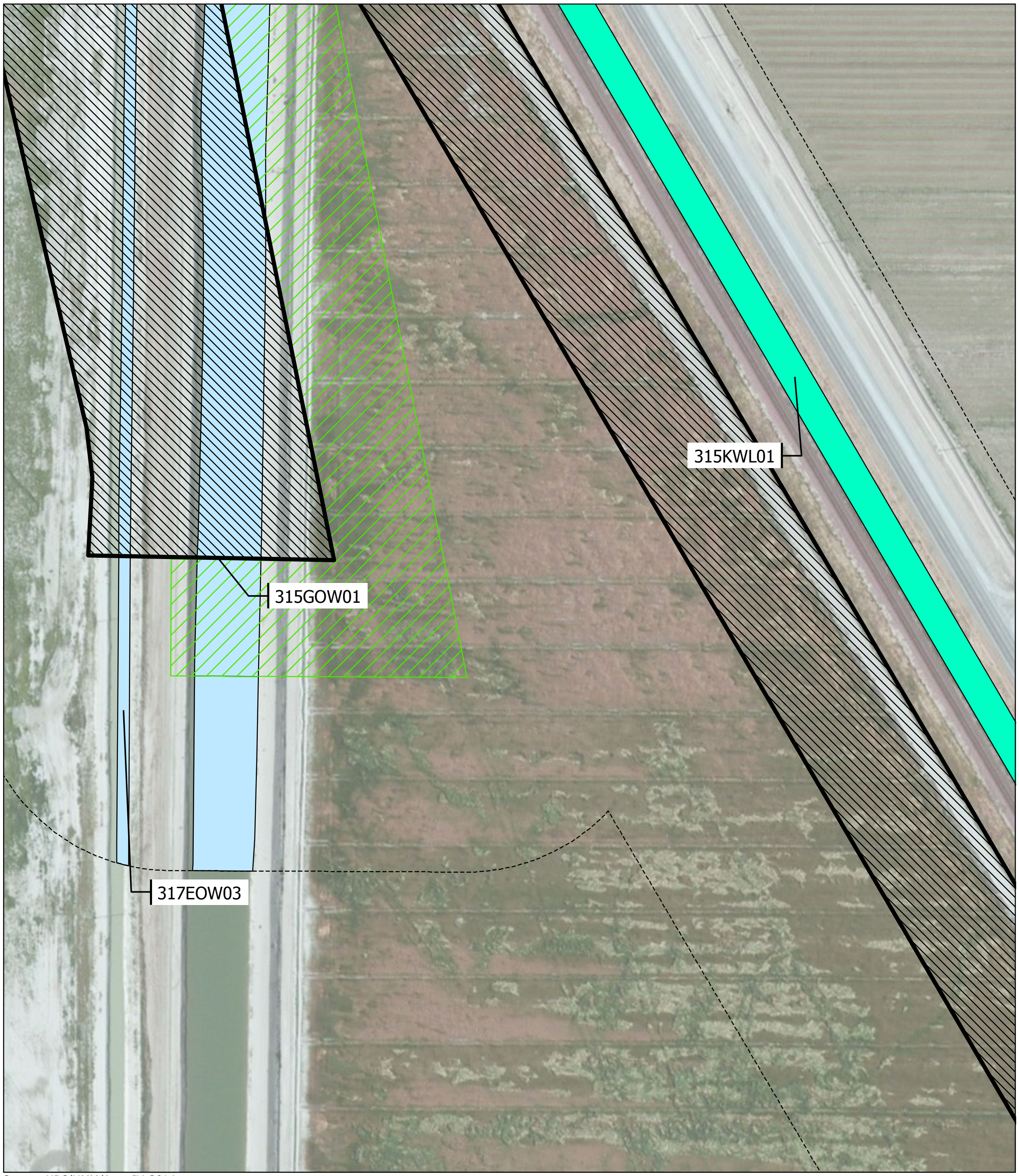

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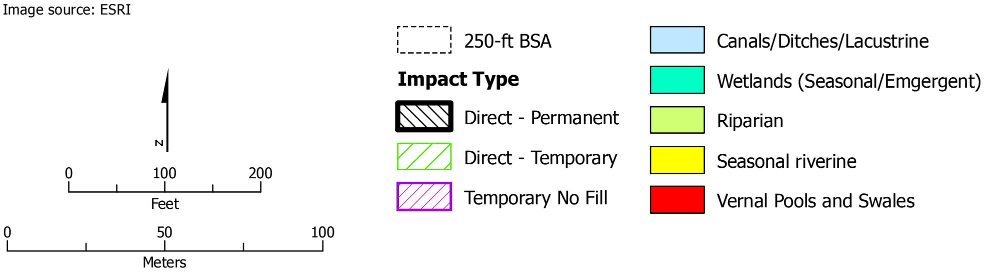

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

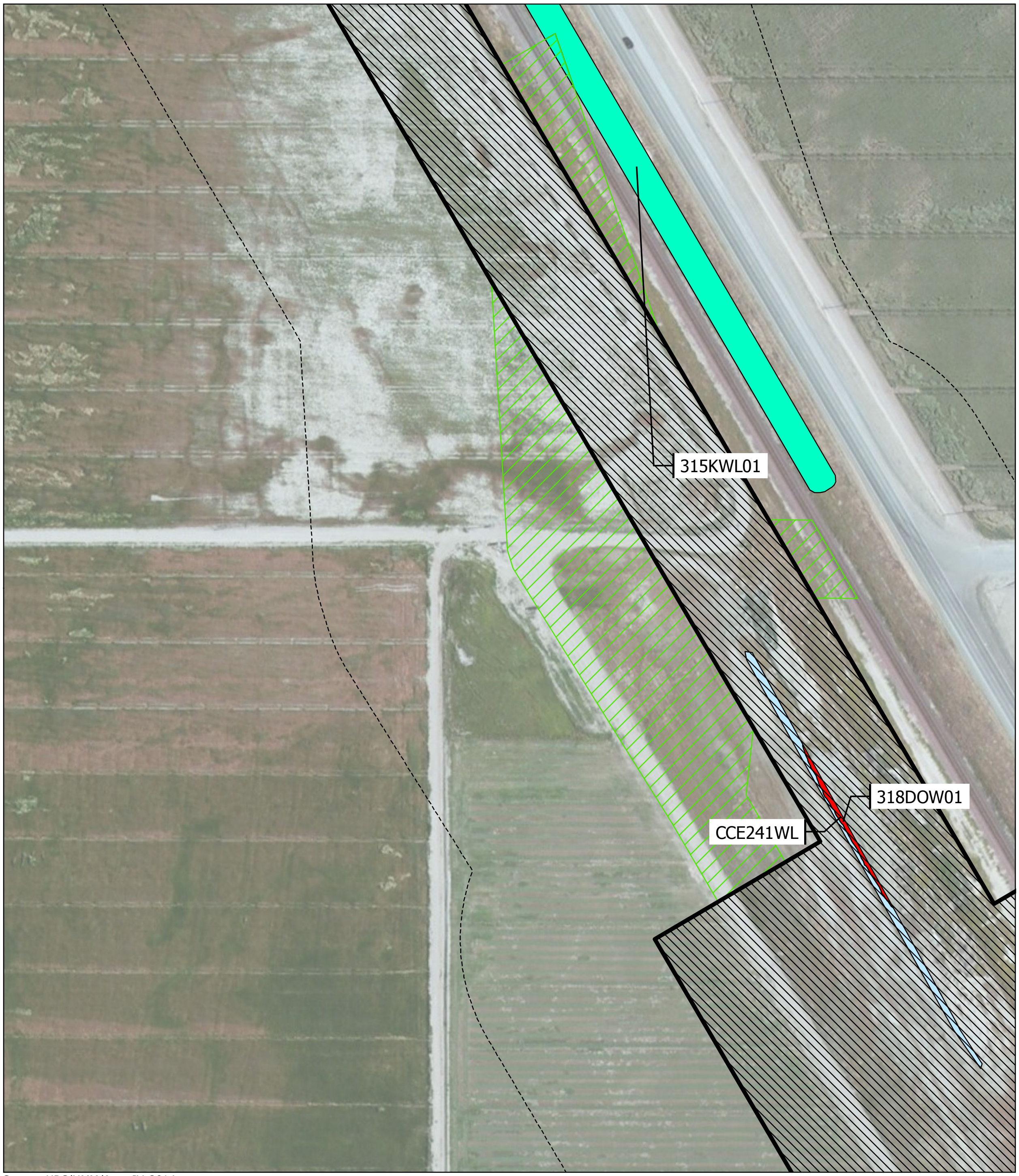
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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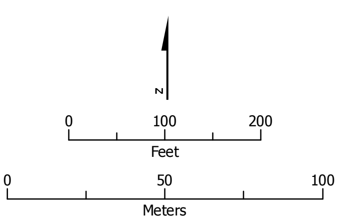
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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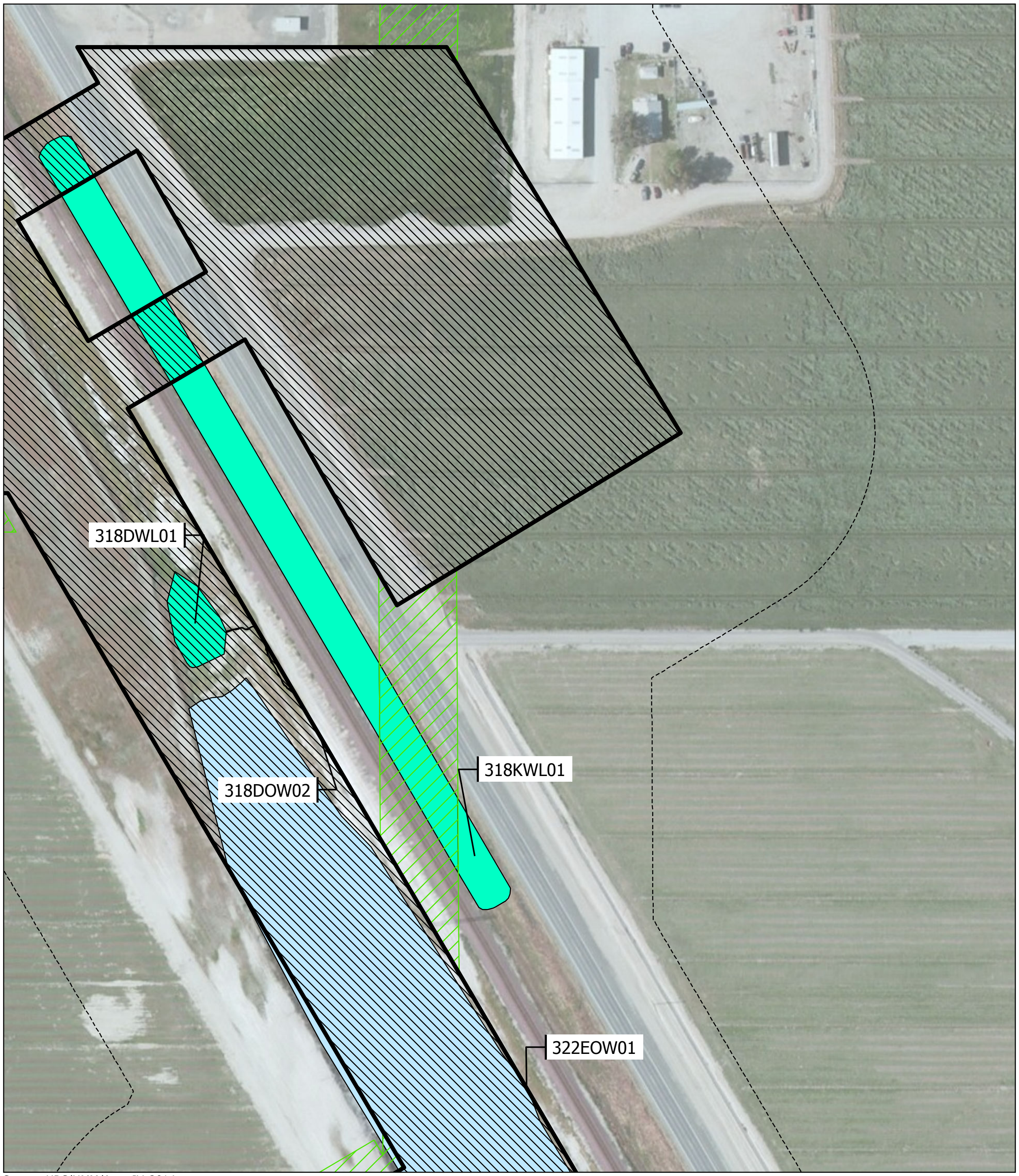

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

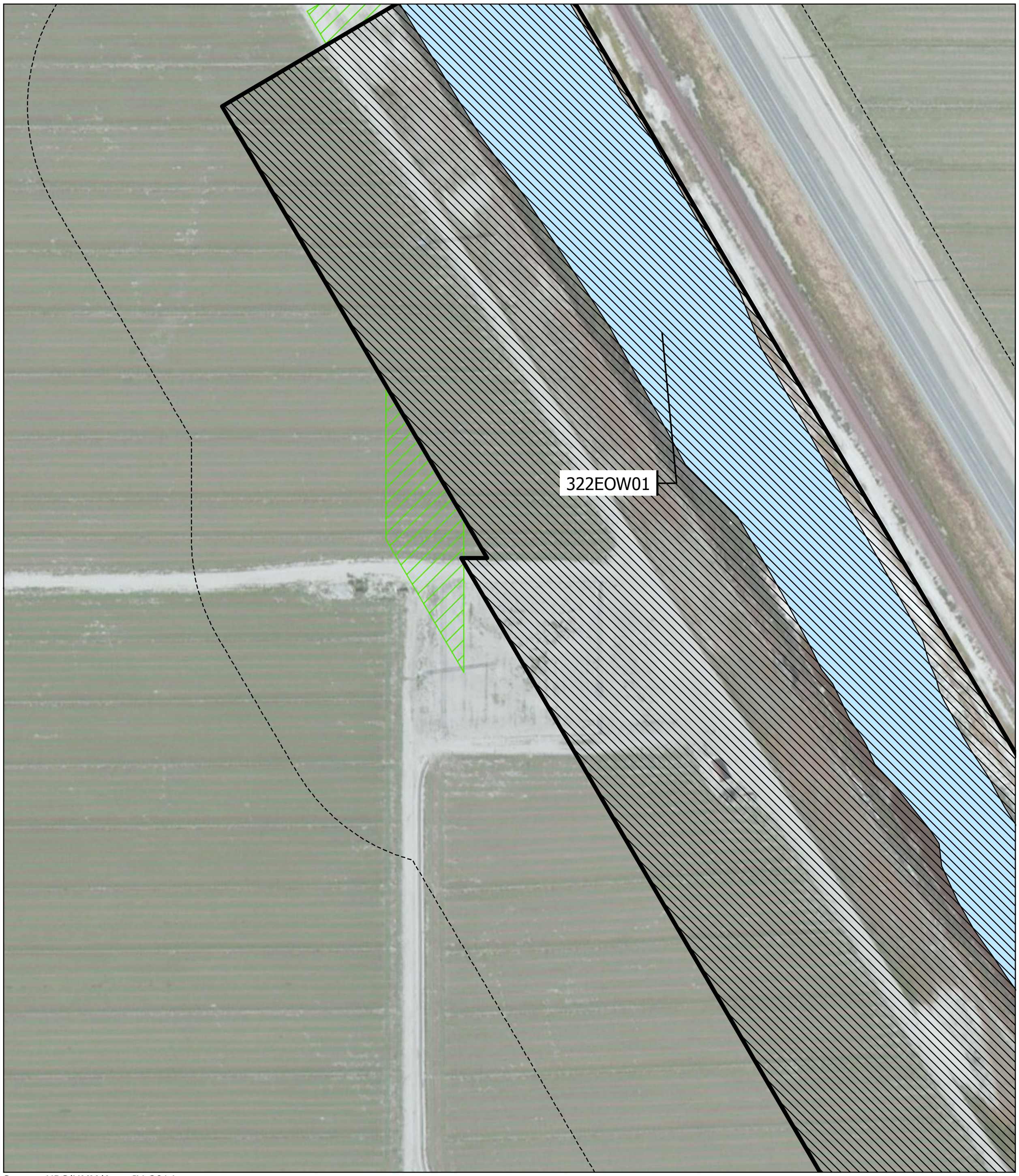

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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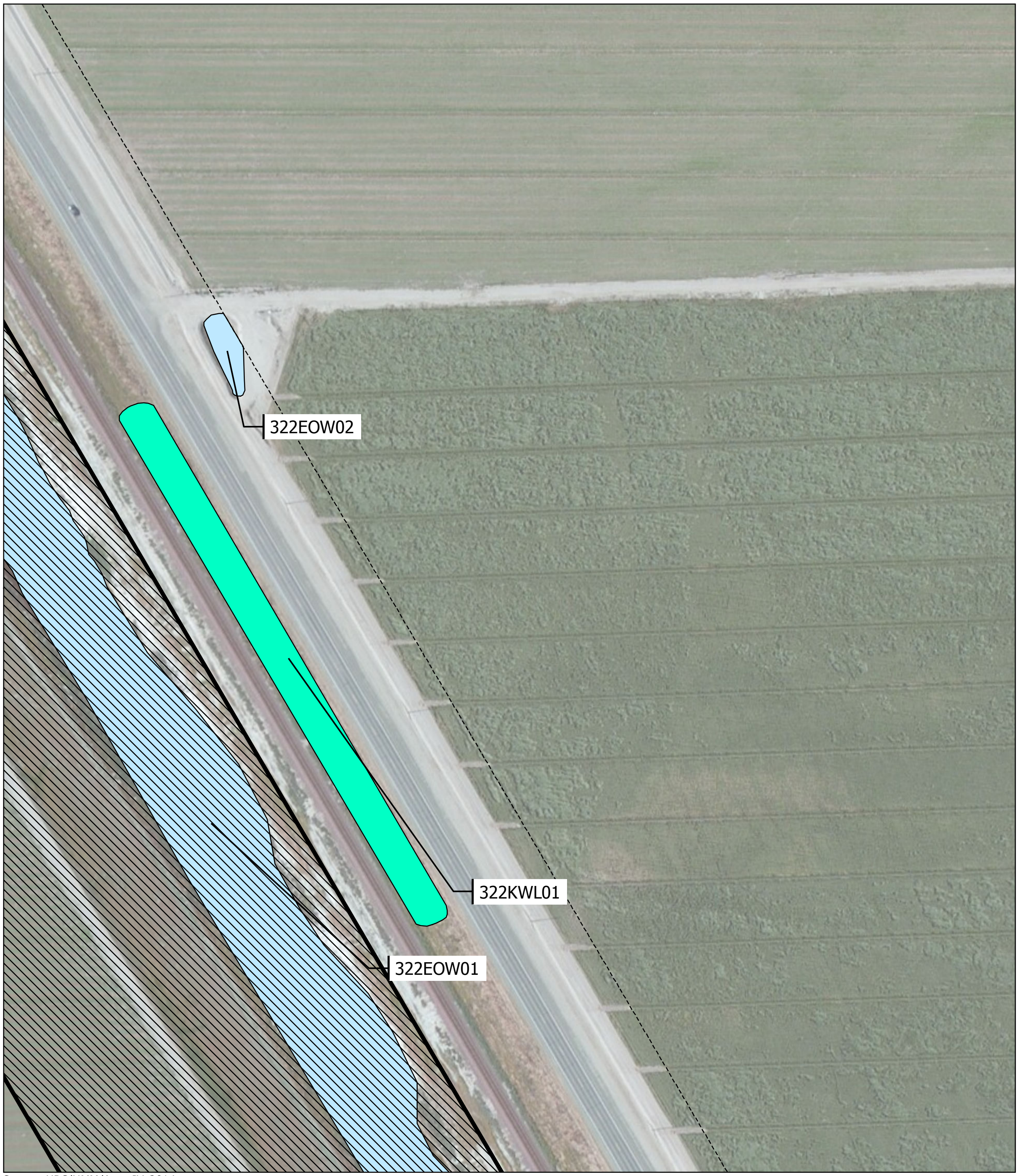

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

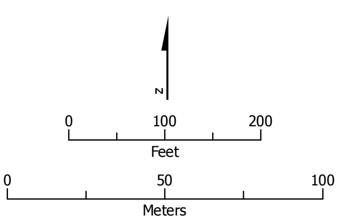
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

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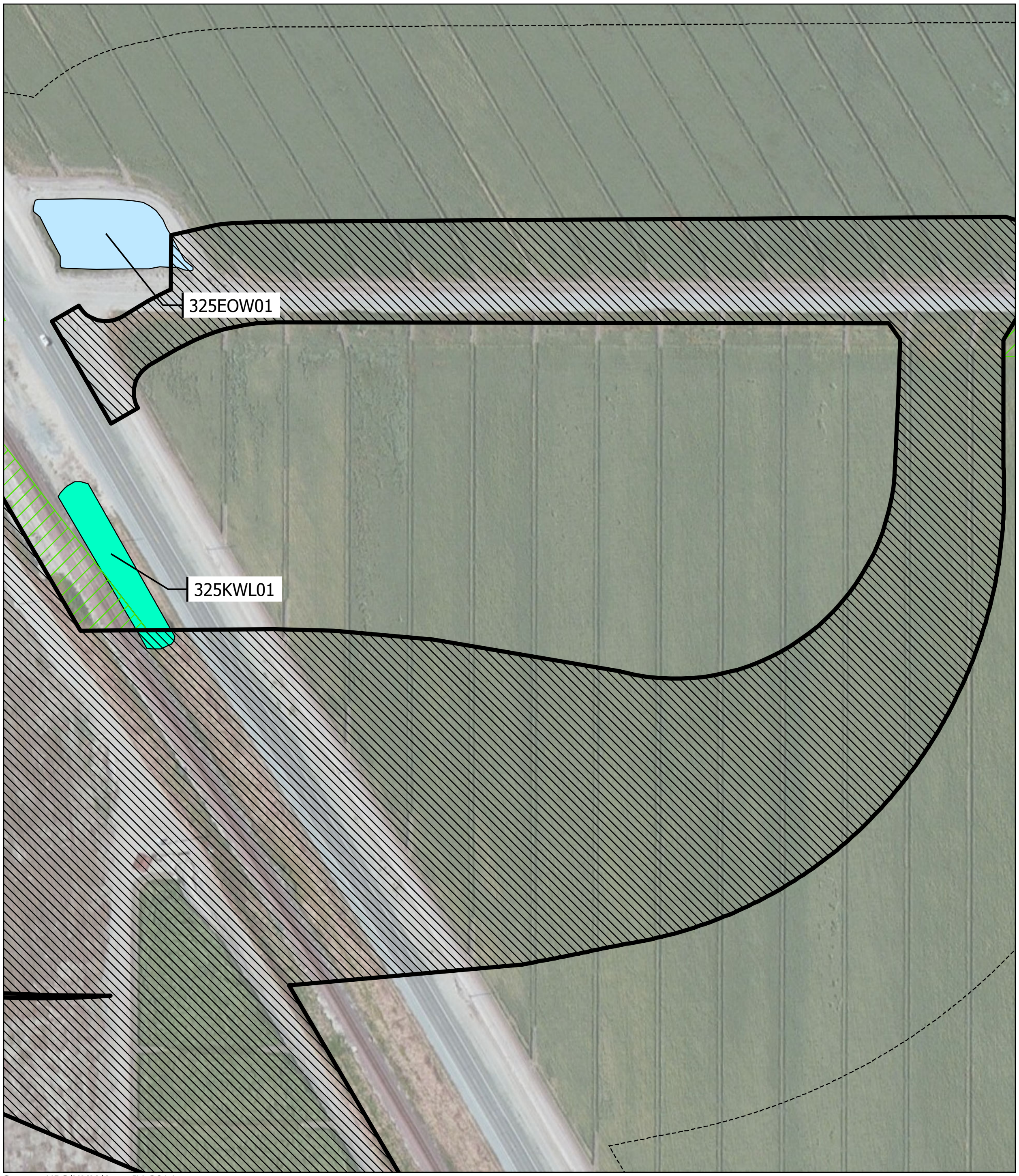

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

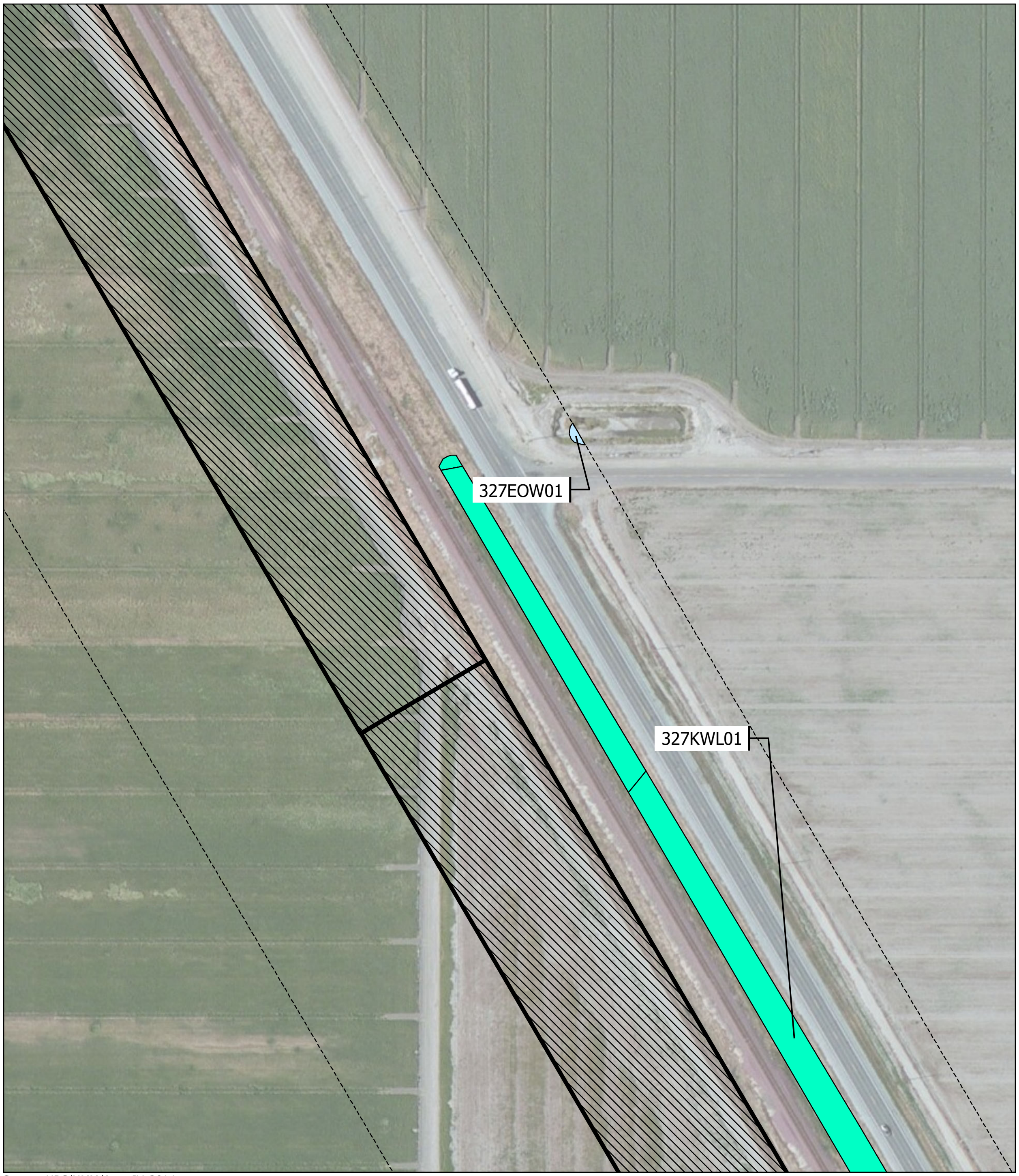

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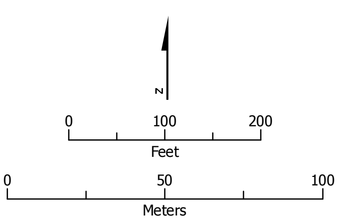
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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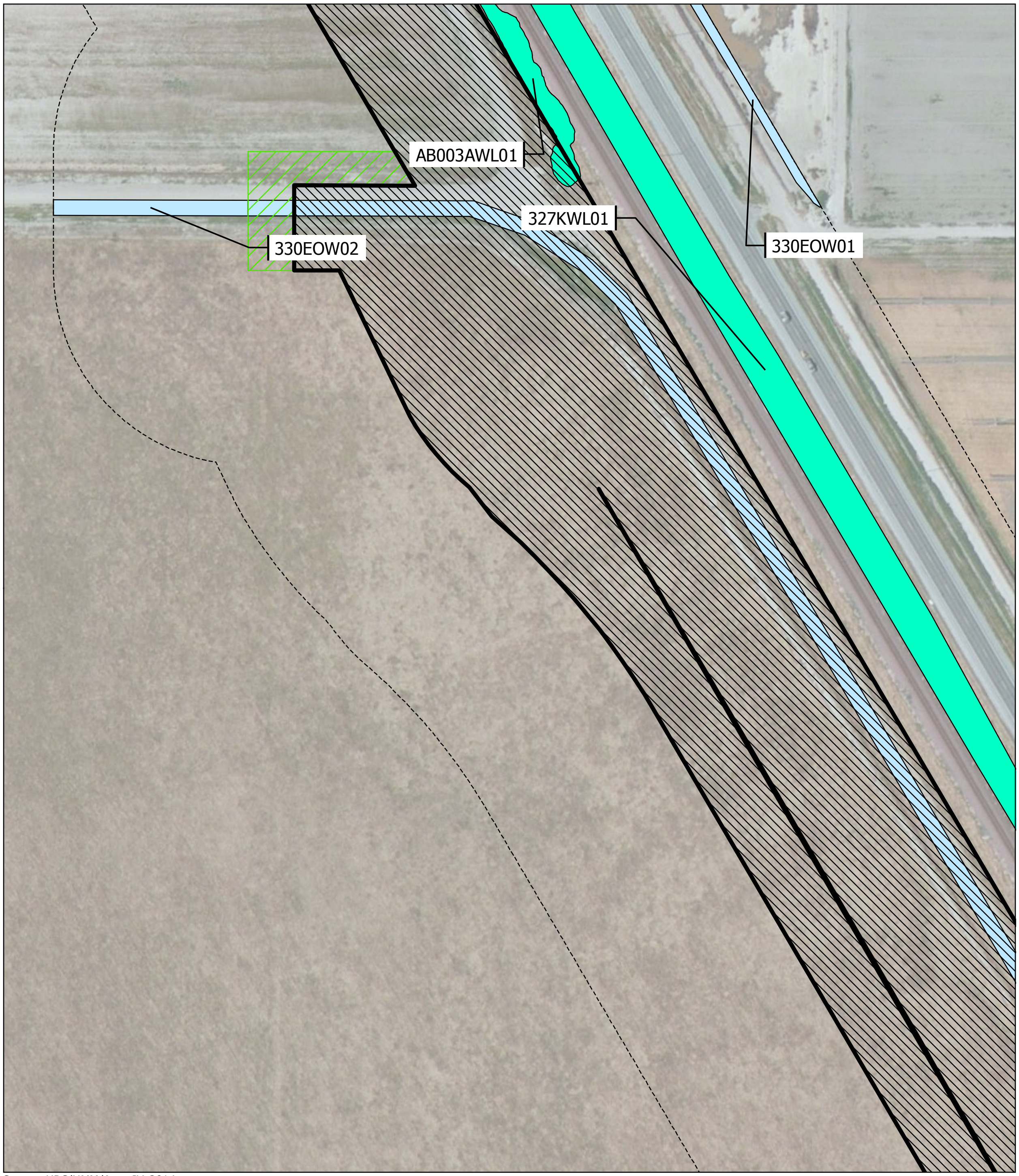

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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

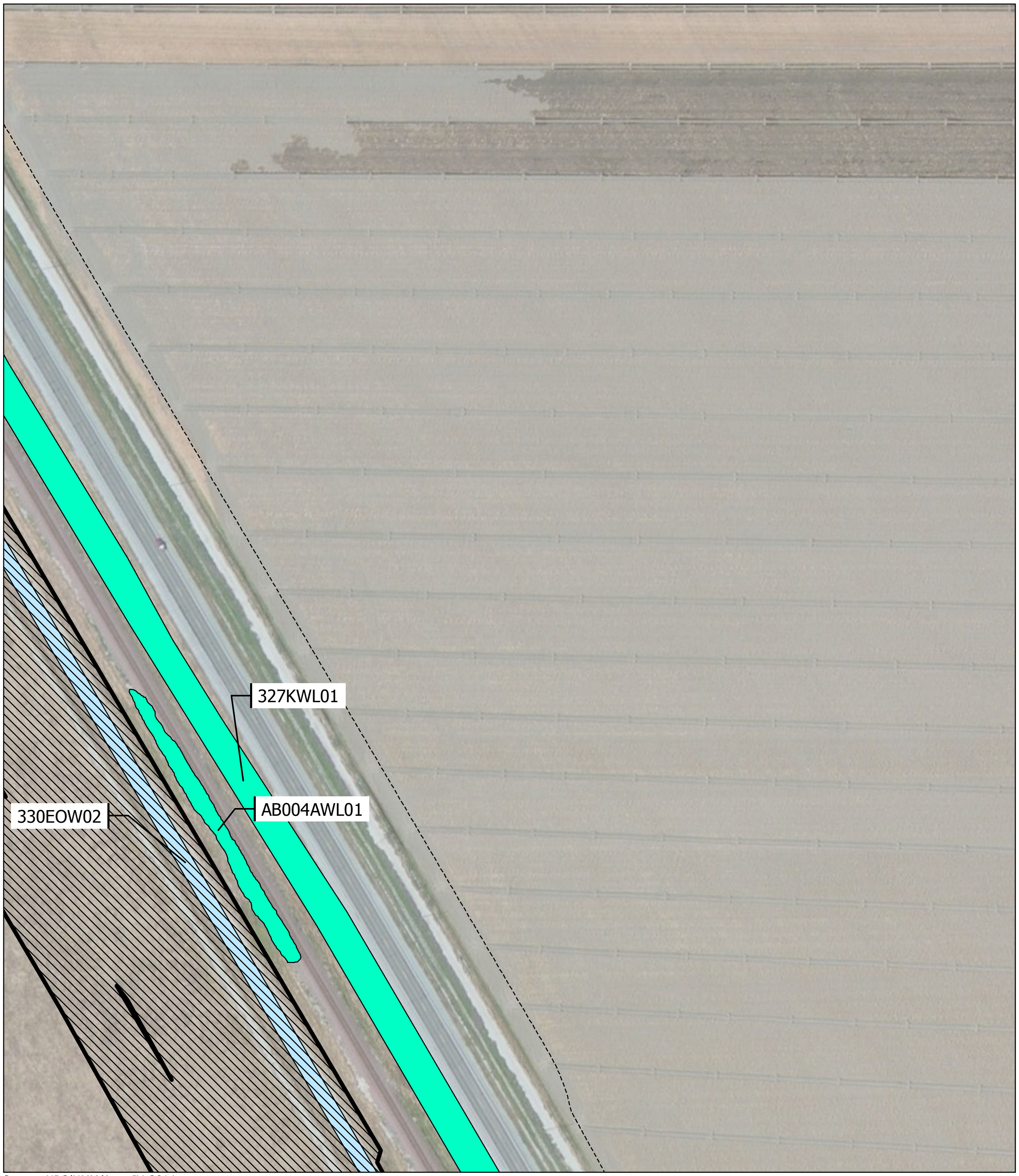

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

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Seasonal riverine

Vernal Pools and Swales

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0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

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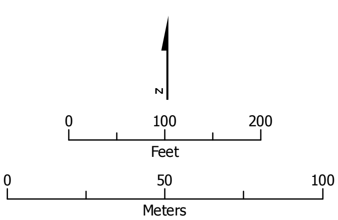

250-ft BSA

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Riparian
Seasonal riverine
Vernal Pools and Swales

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Project Impact Mapbook

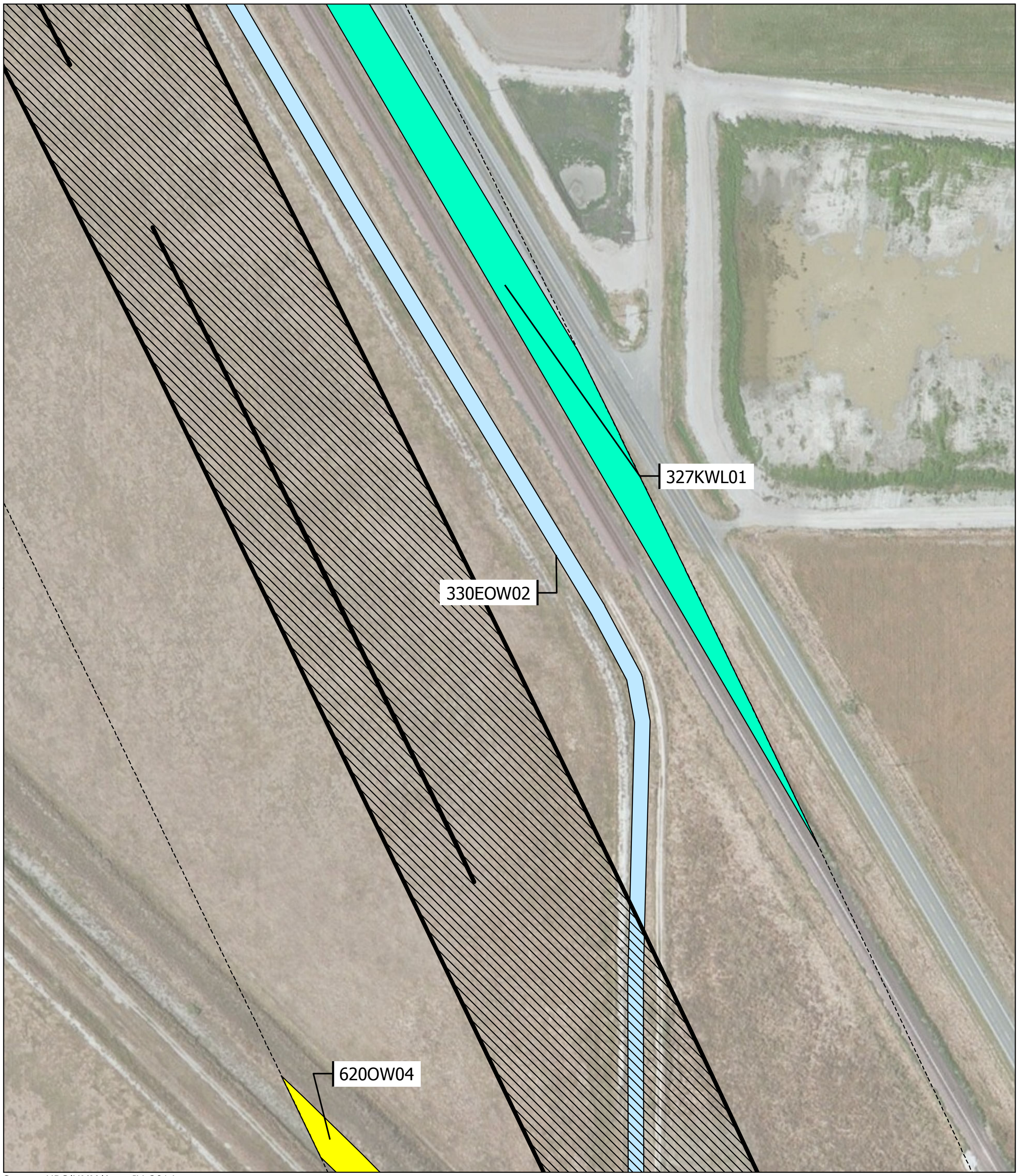

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

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Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
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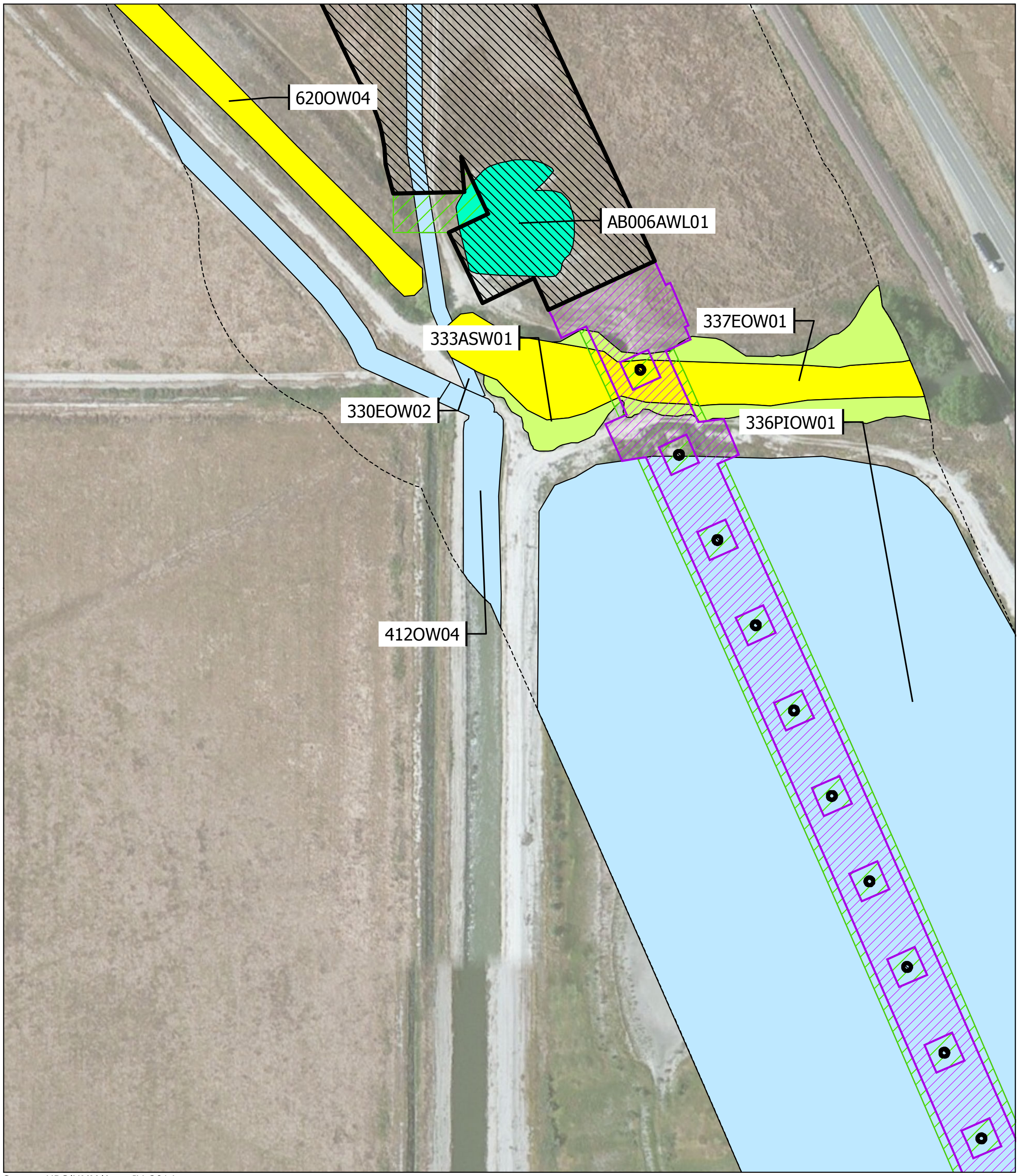

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

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Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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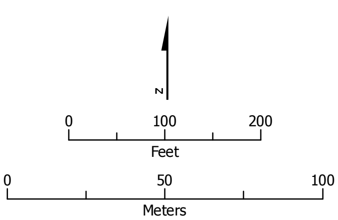
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

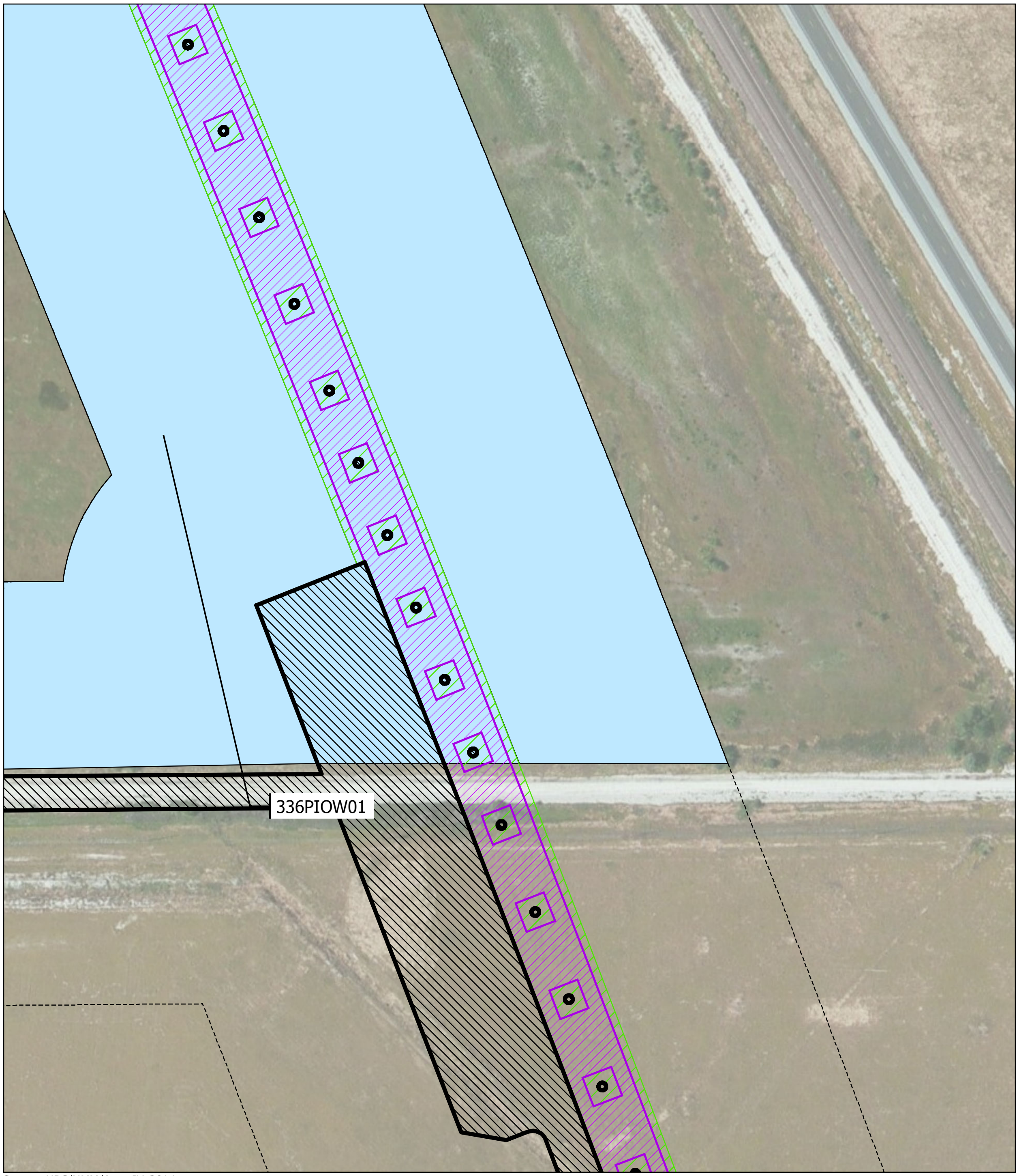

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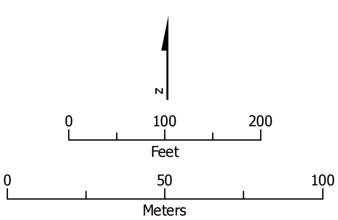
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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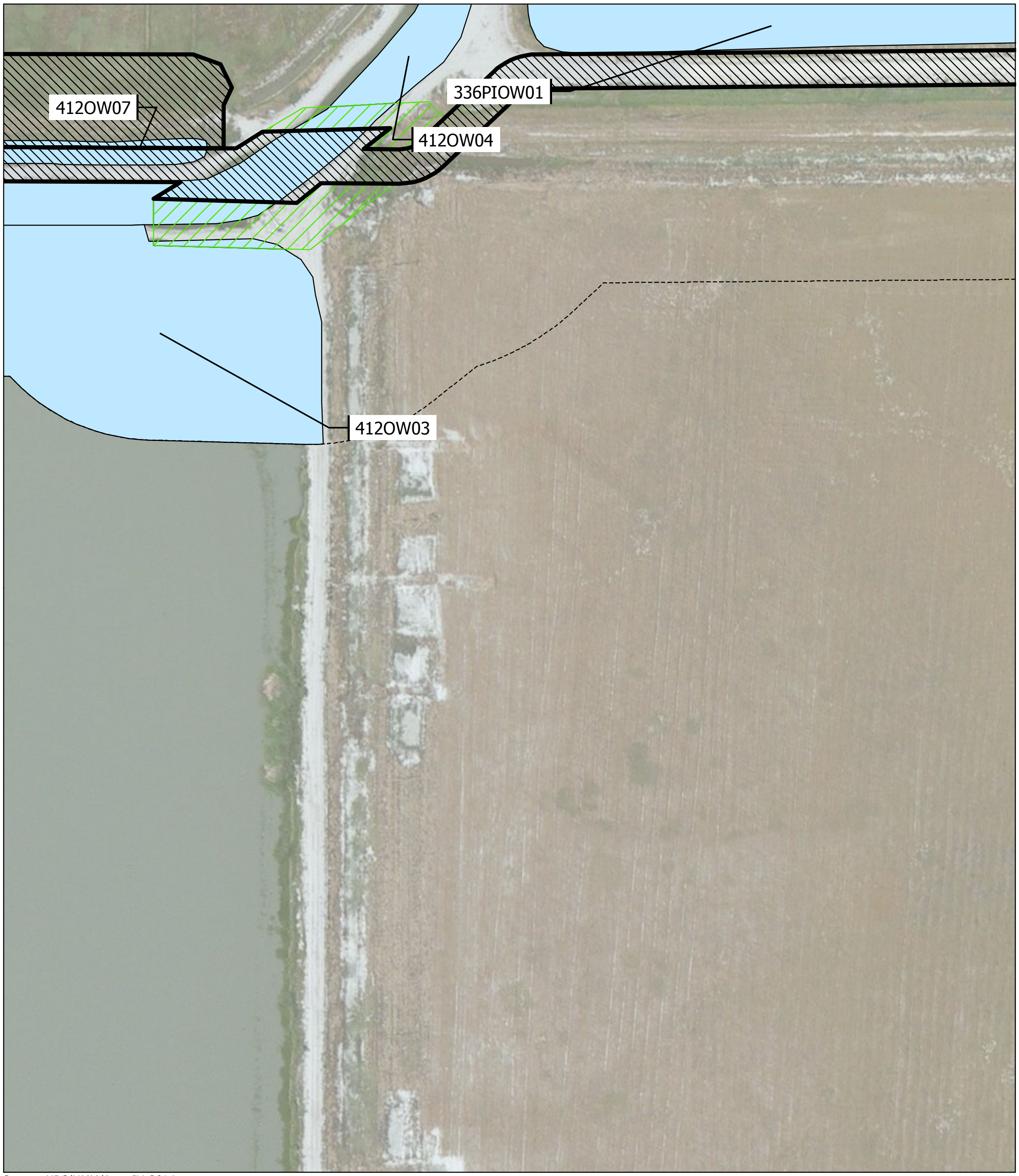

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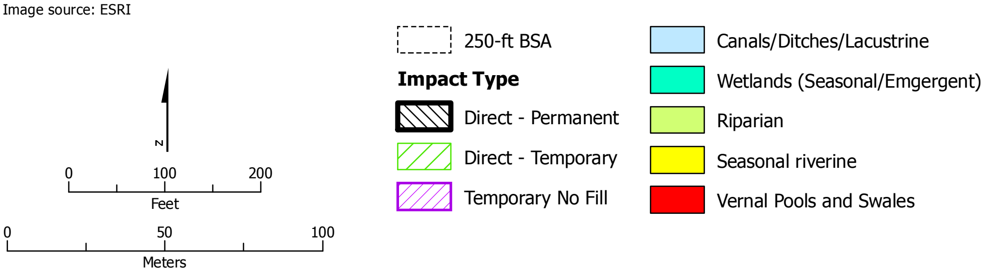

Appendix 4
Project Impact Mapbook

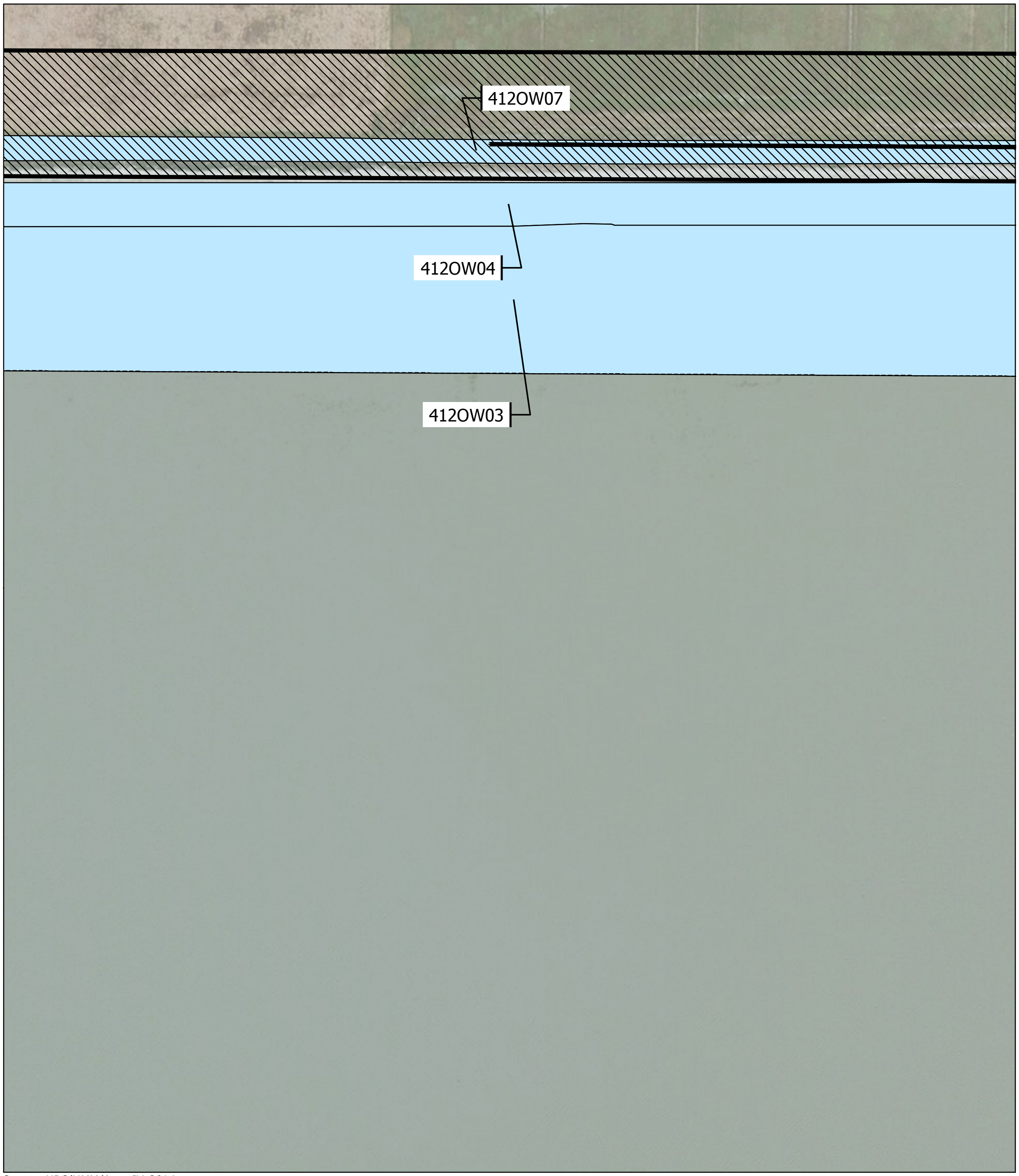

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Image source: ESRI

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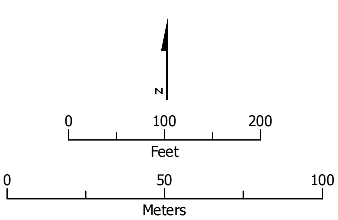

250-ft BSA

Impact Type

Direct - Permanent

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Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
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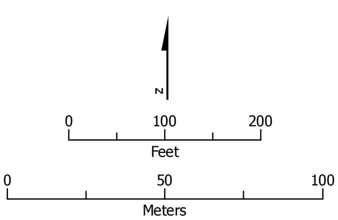

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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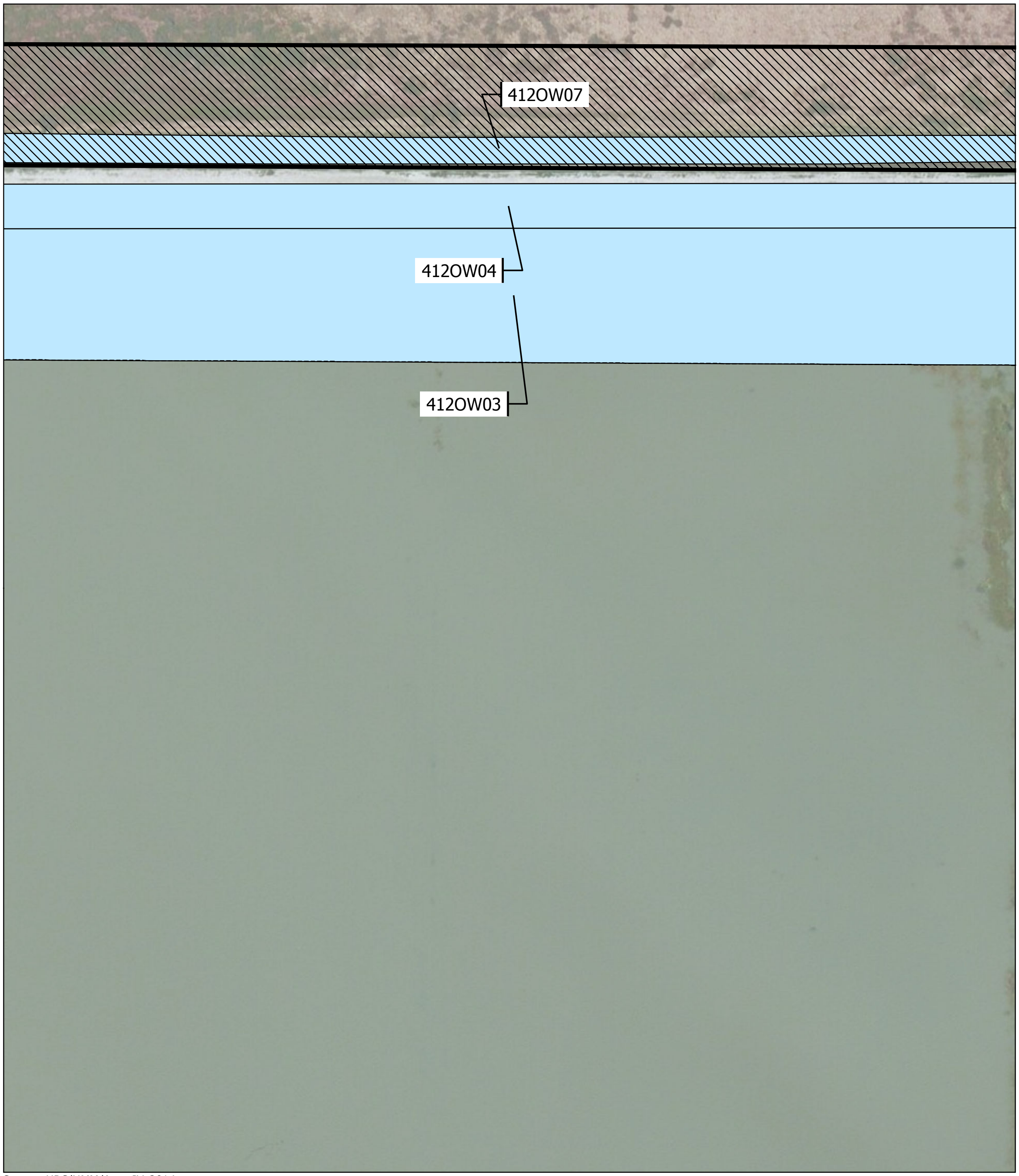

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

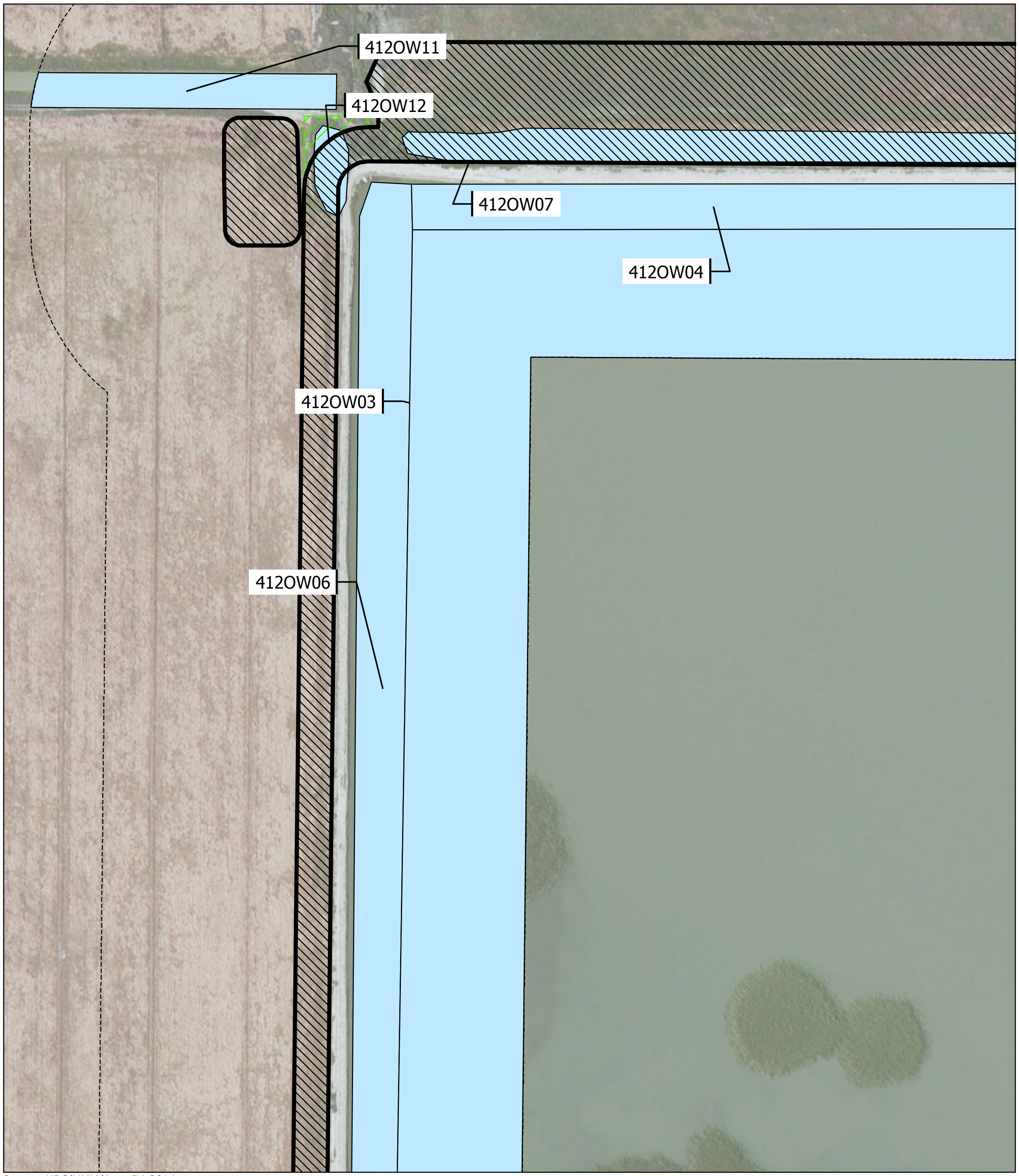

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

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Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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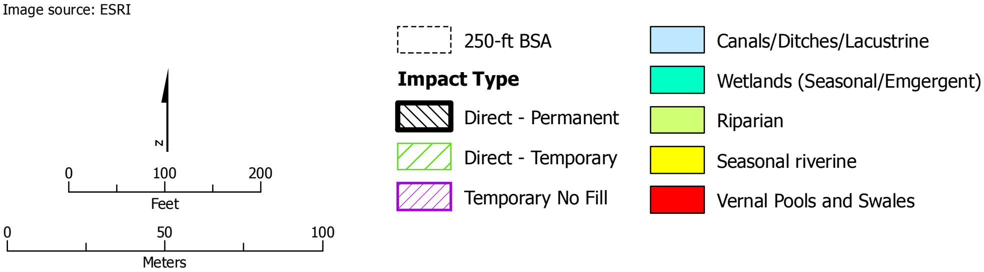
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
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- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emgergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

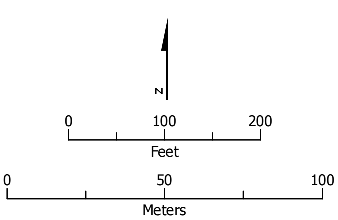
Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales



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Project Impact Mapbook

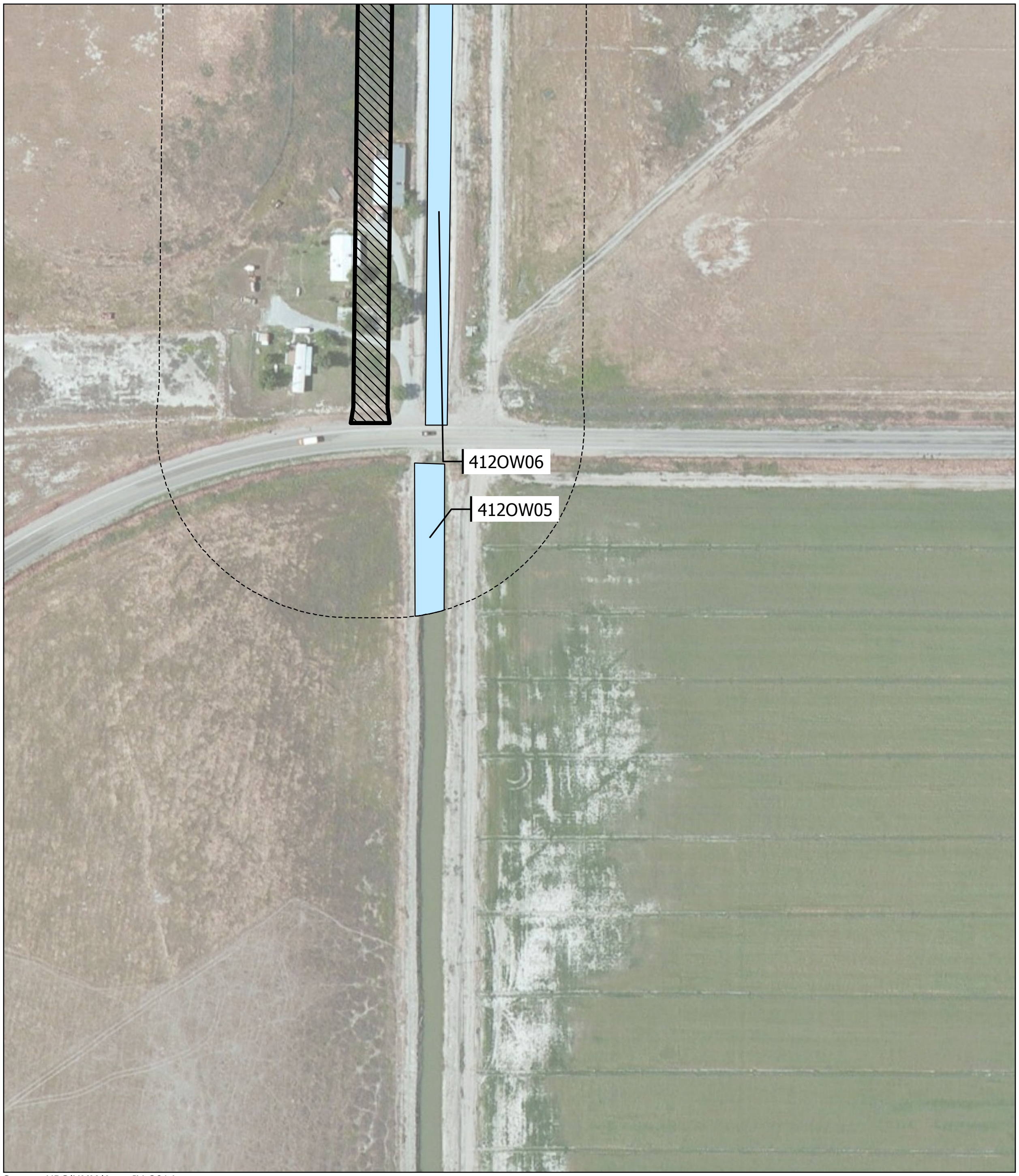

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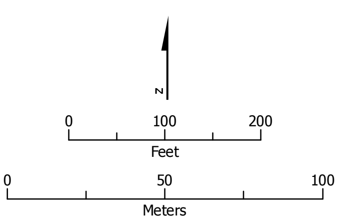
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

0 100 200
Feet

0 50 100
Meters

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

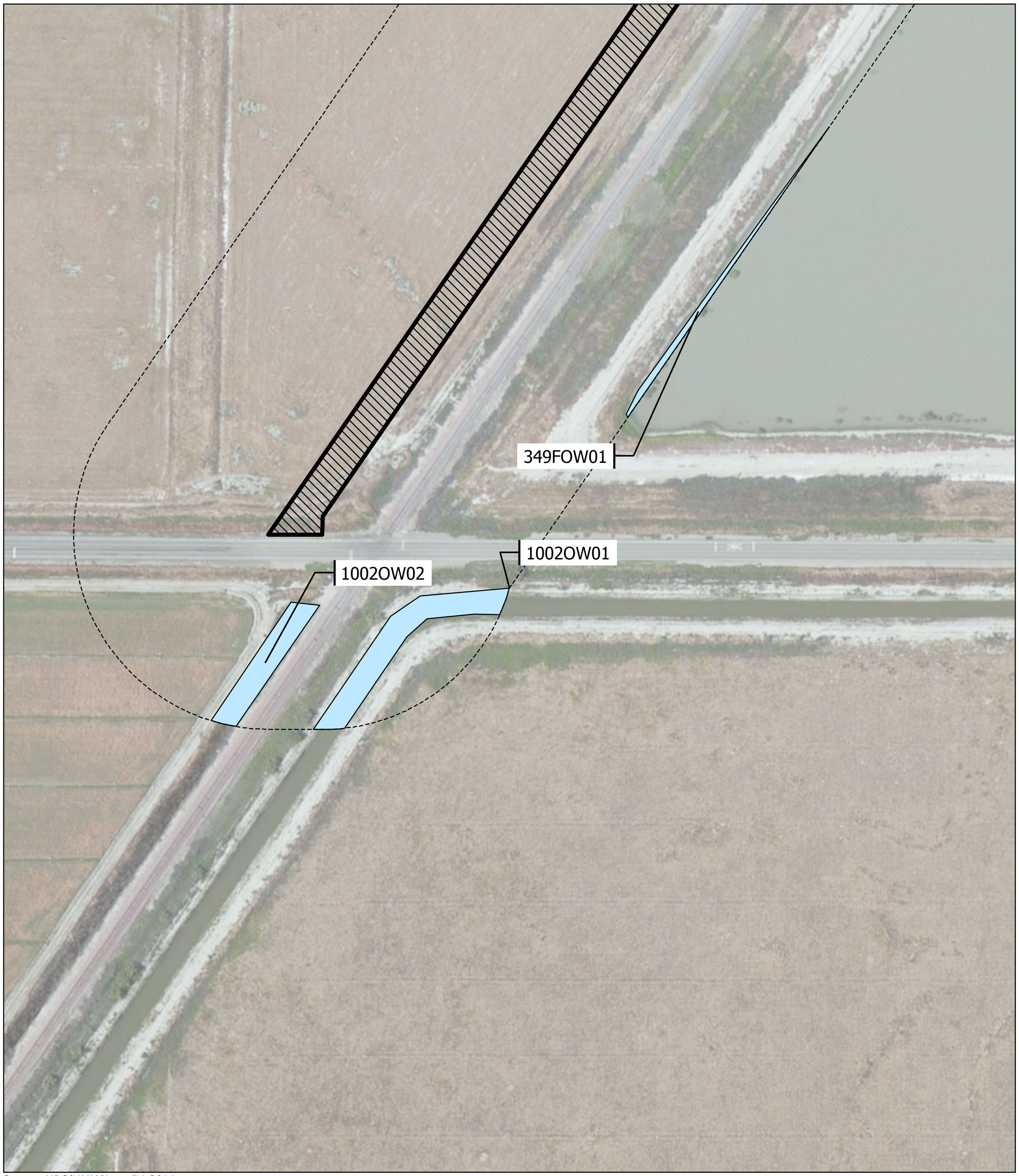
Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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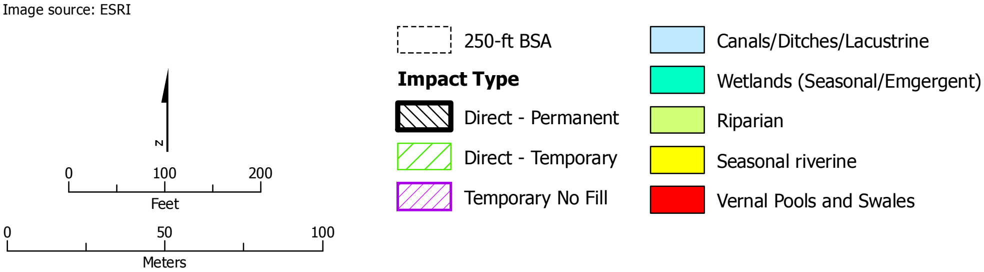

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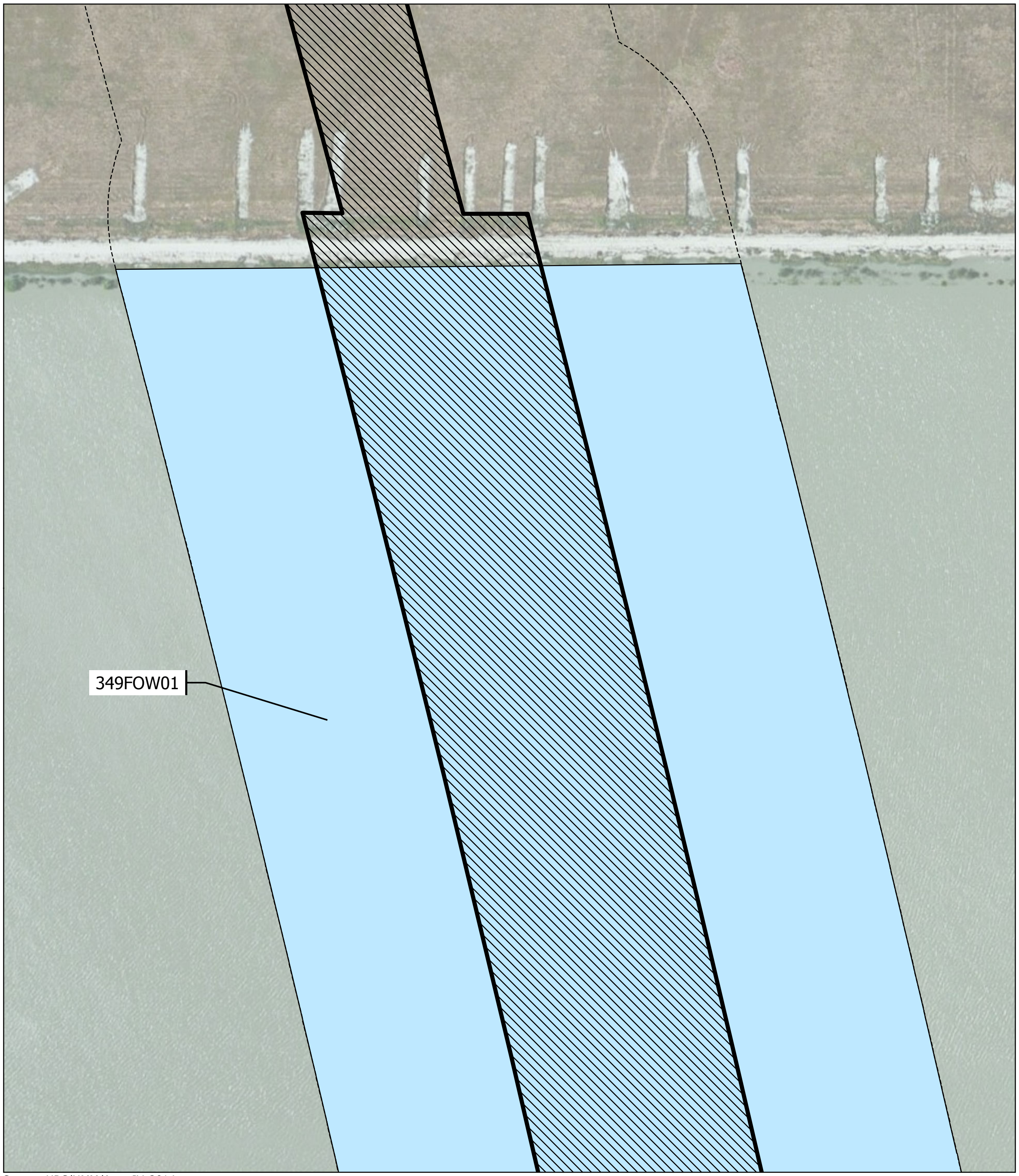
Project Impact Mapbook



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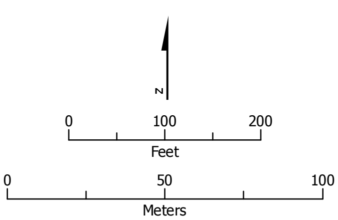

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

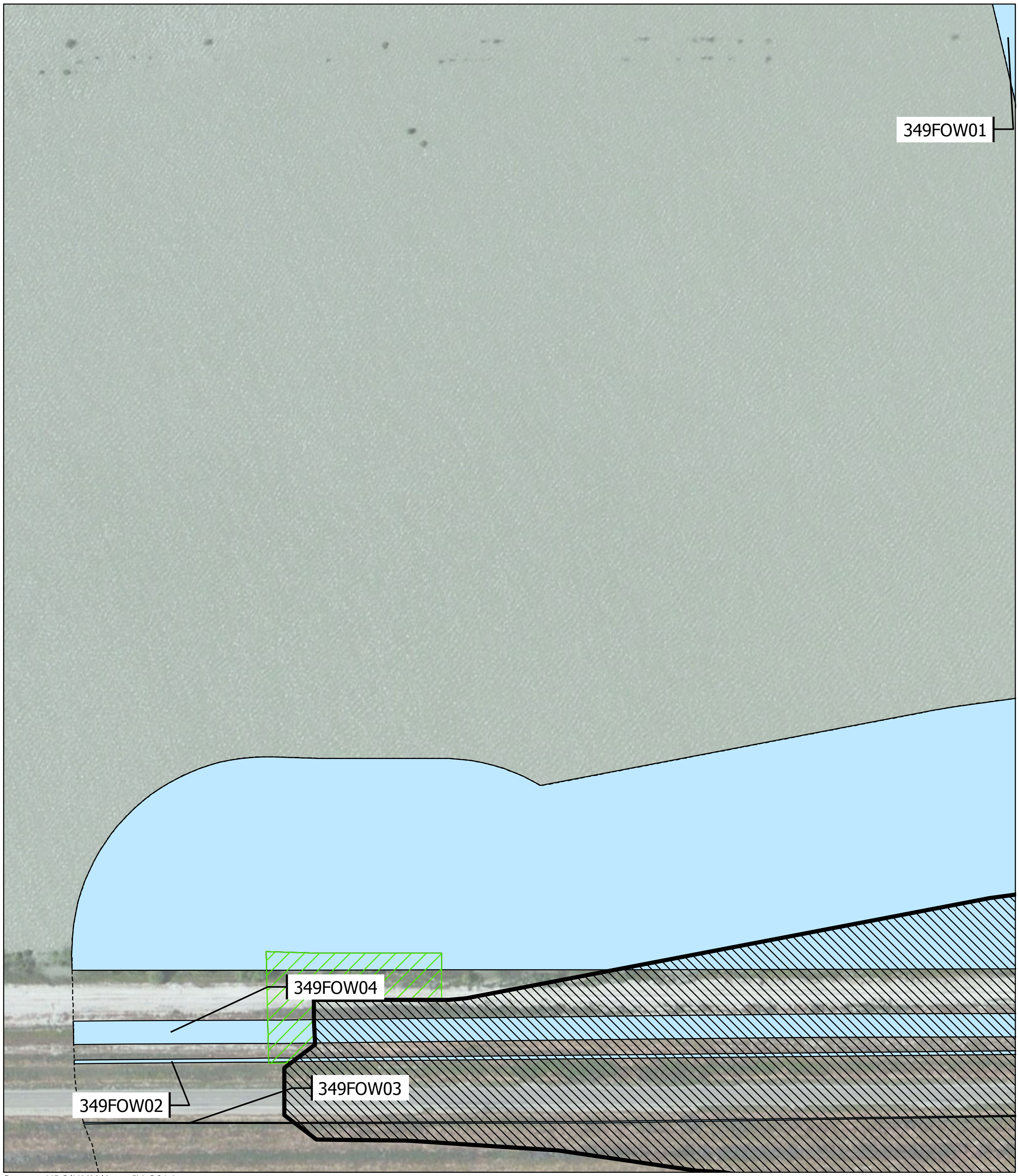
Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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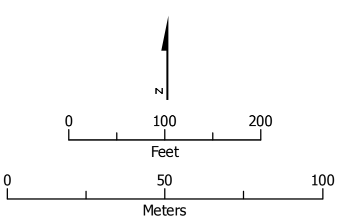

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

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Project Impact Mapbook
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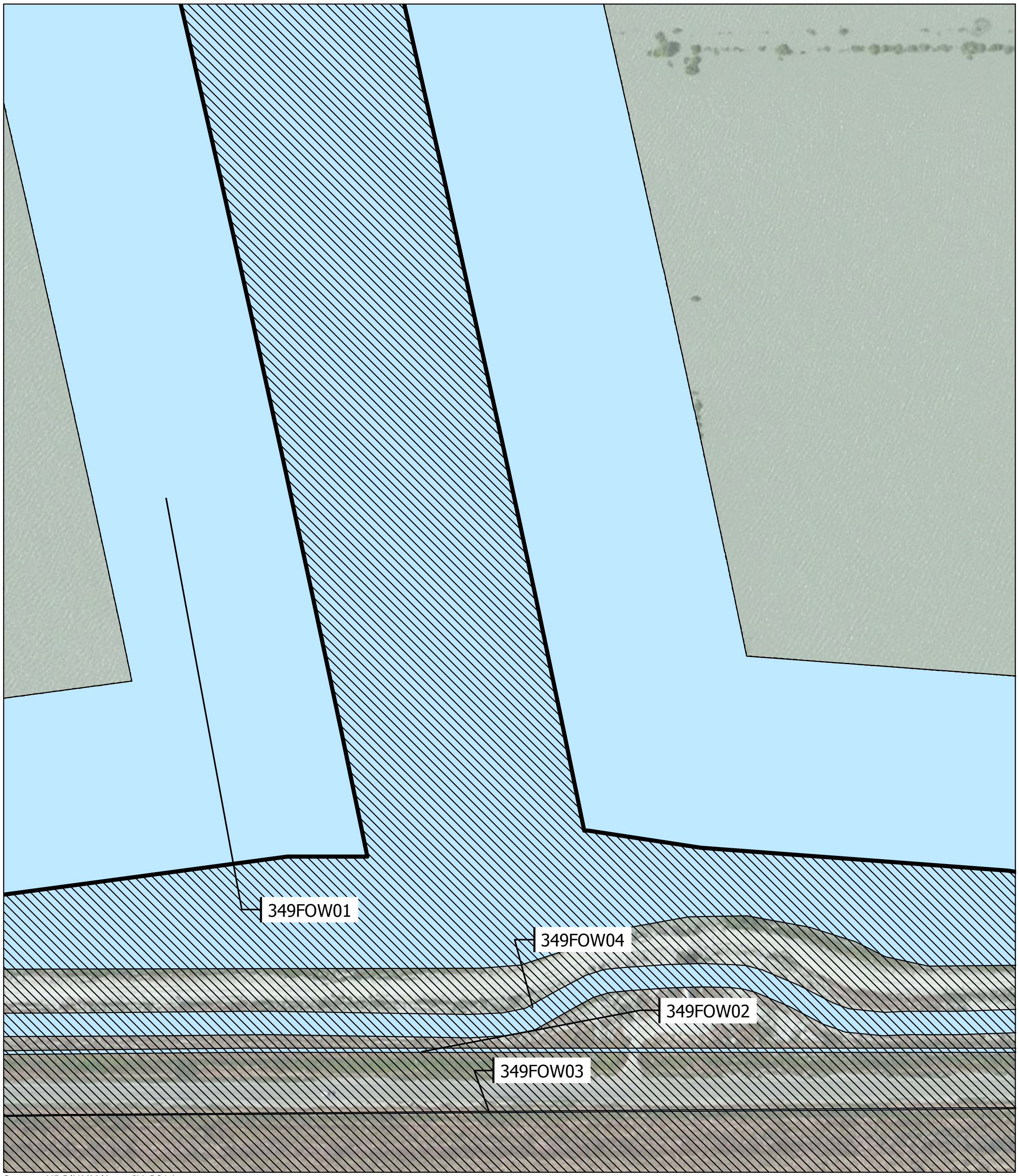

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

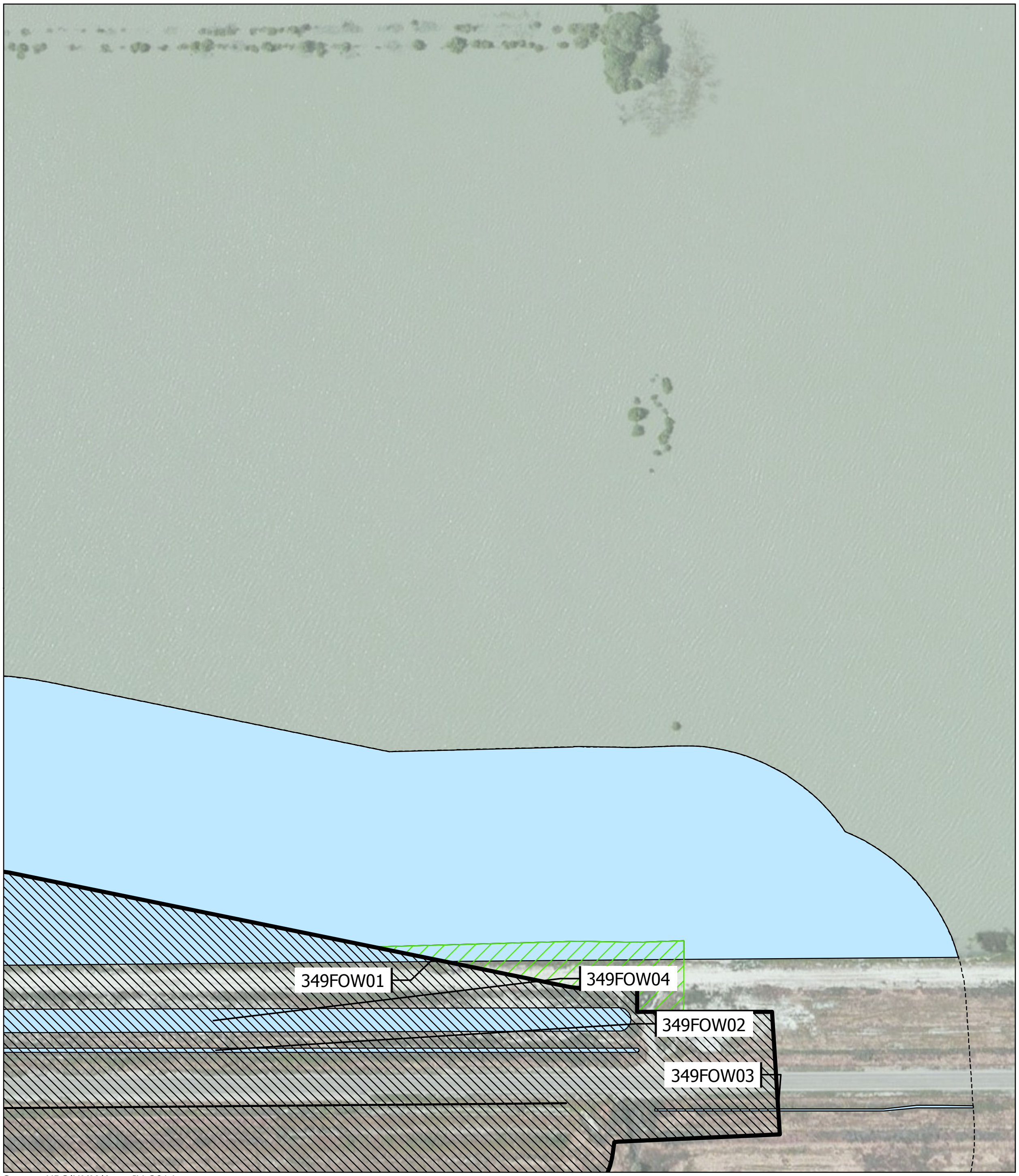
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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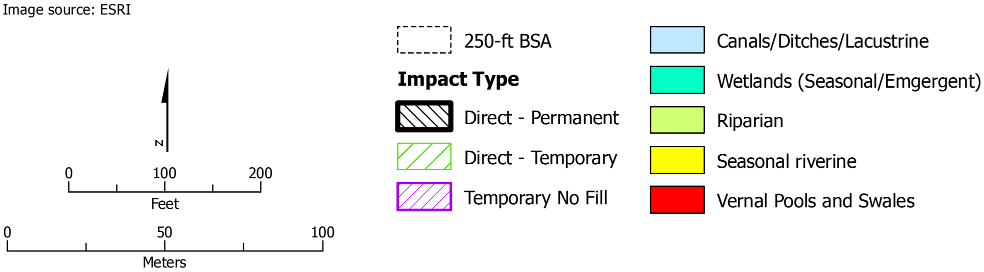

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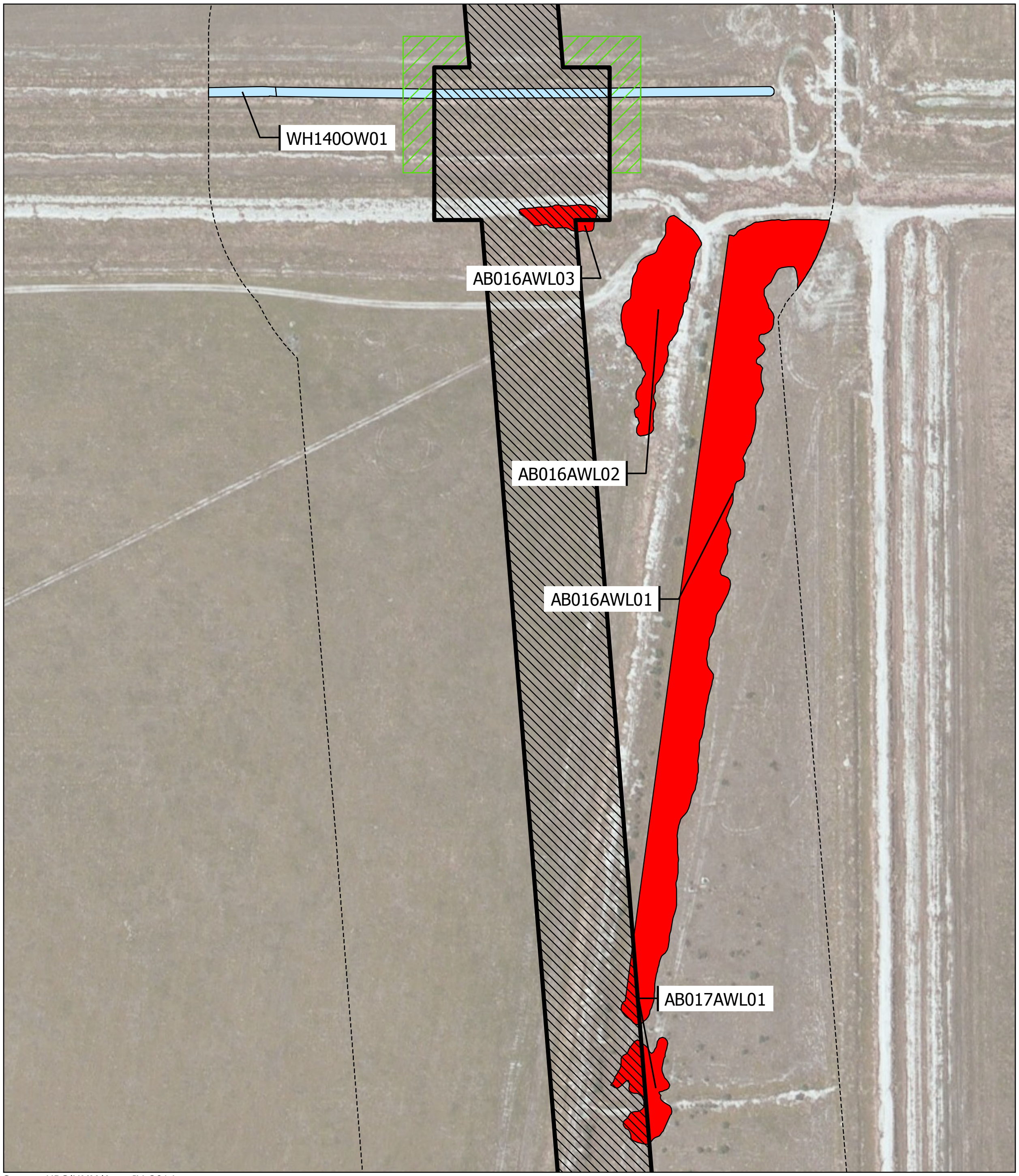

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

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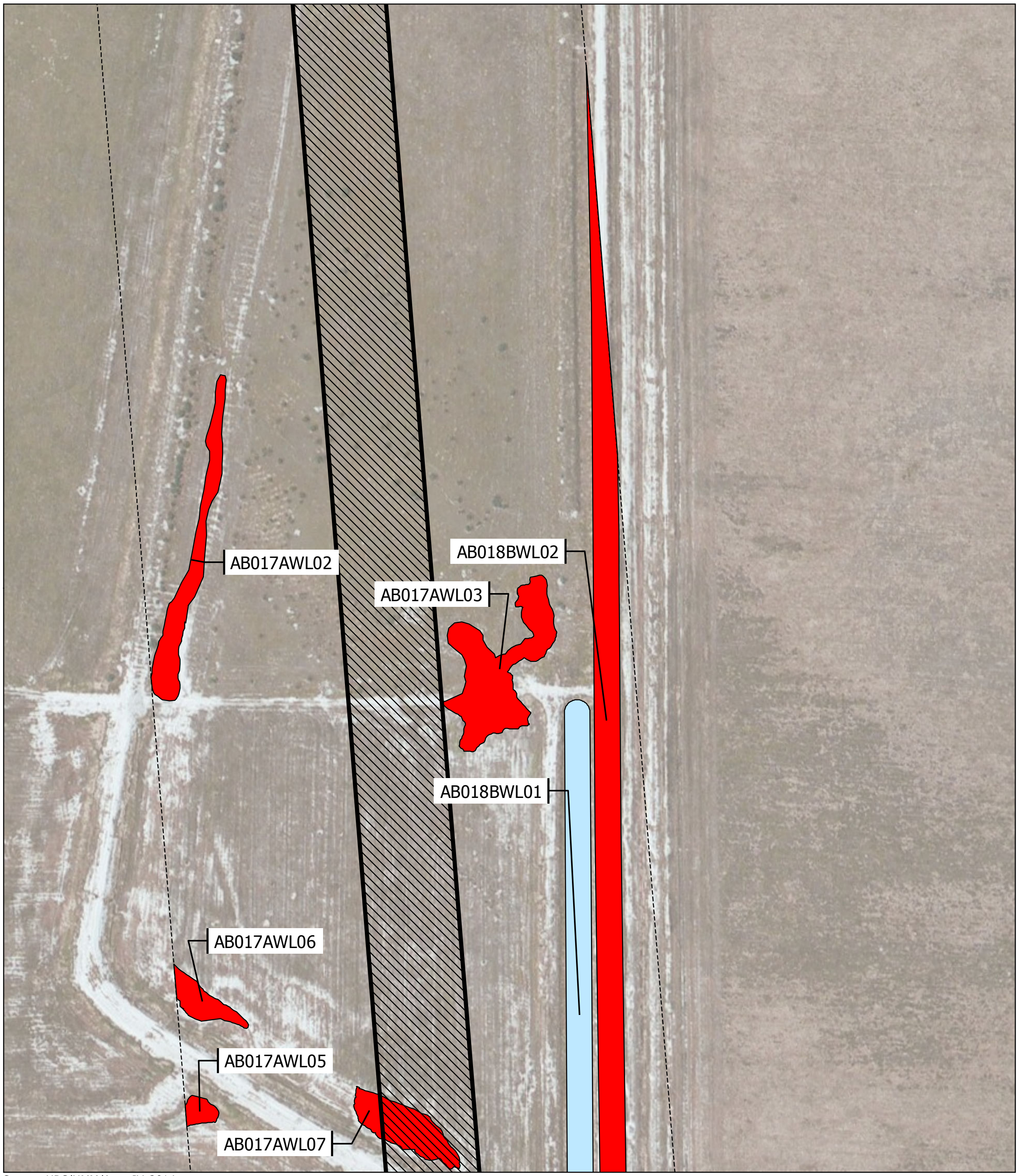

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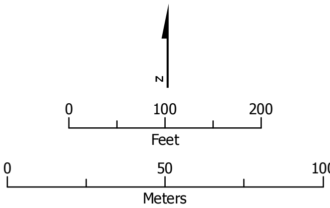

250-ft BSA

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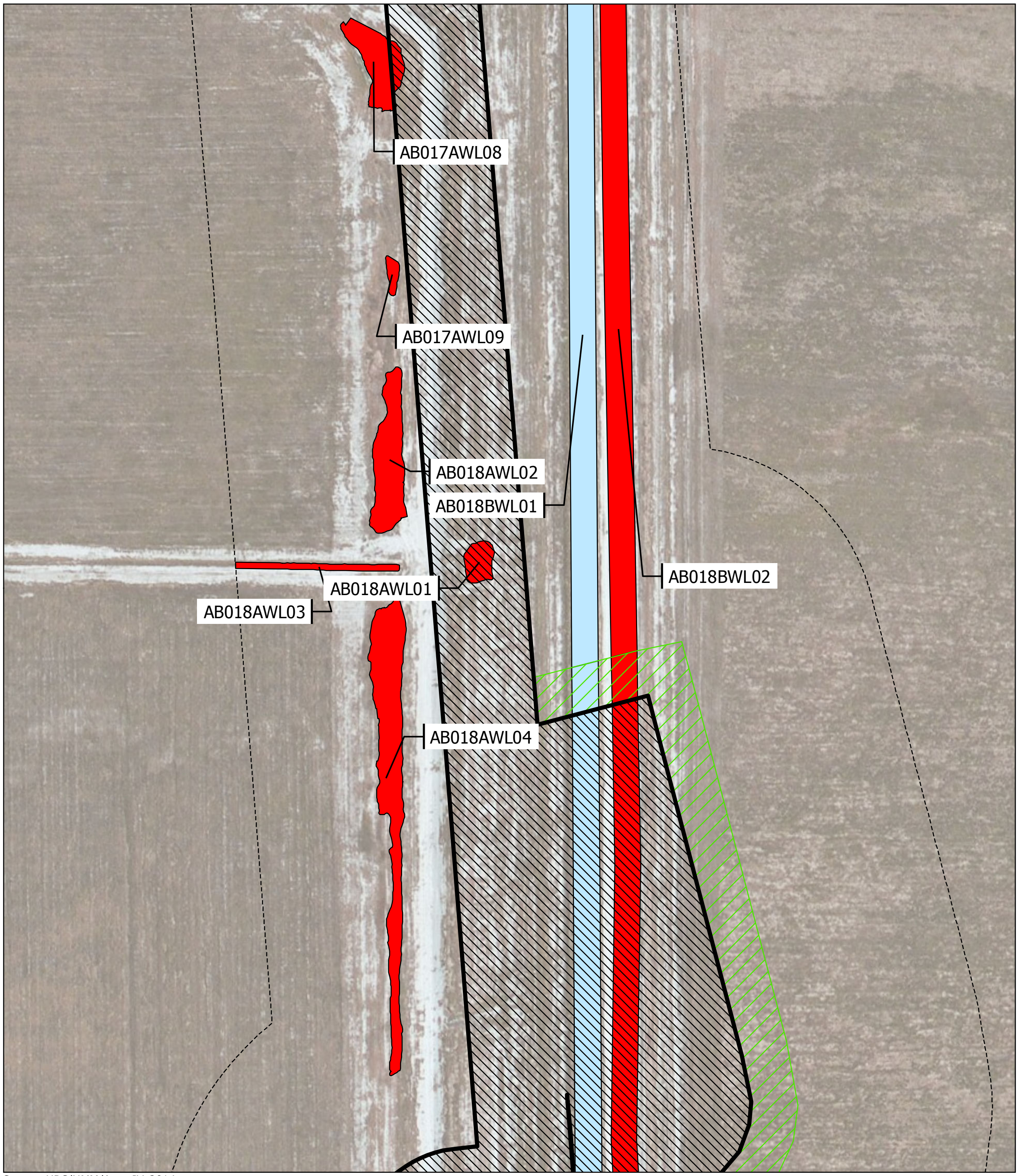
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales



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250-ft BSA

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Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

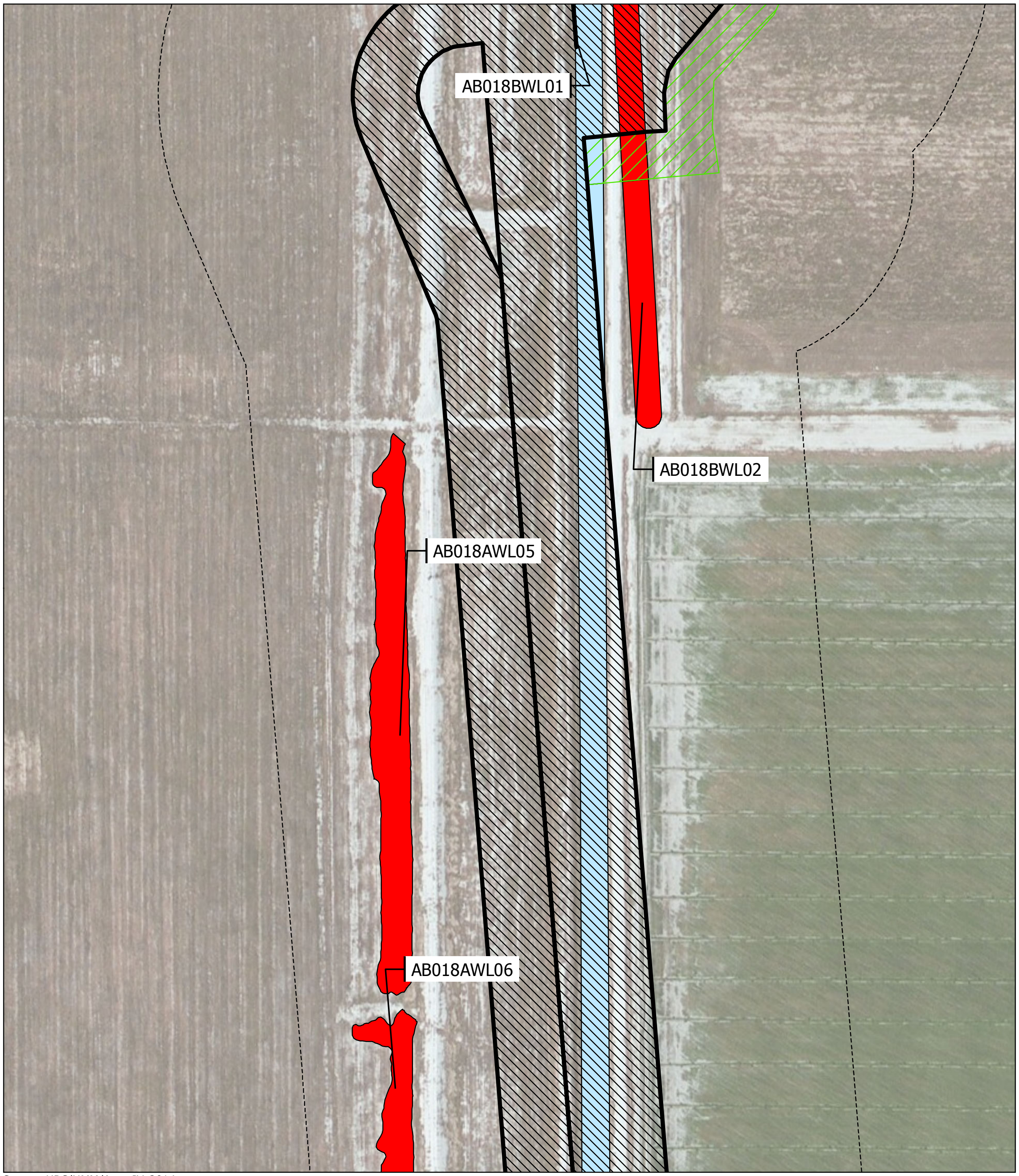

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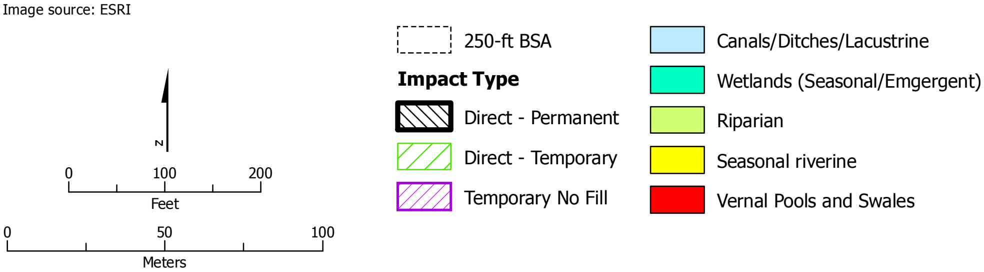
Image source: ESRI

January 22, 2014



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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

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Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

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Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
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January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

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Seasonal riverine

Vernal Pools and Swales

0 100 200 Feet

0 50 100 Meters

Appendix 4
Project Impact Mapbook
Page 190 of 246

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

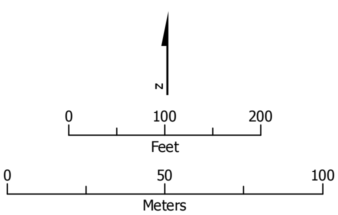
Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales



Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

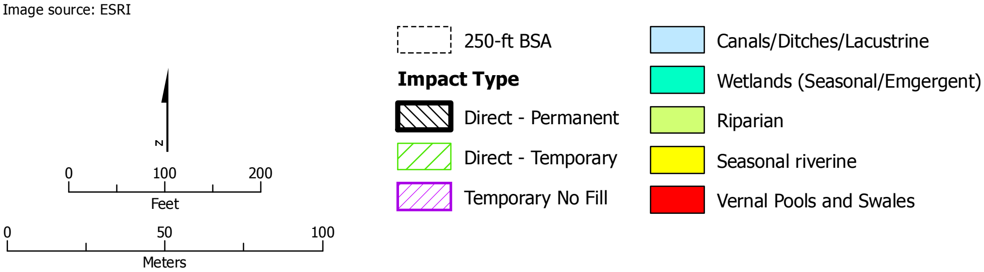
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

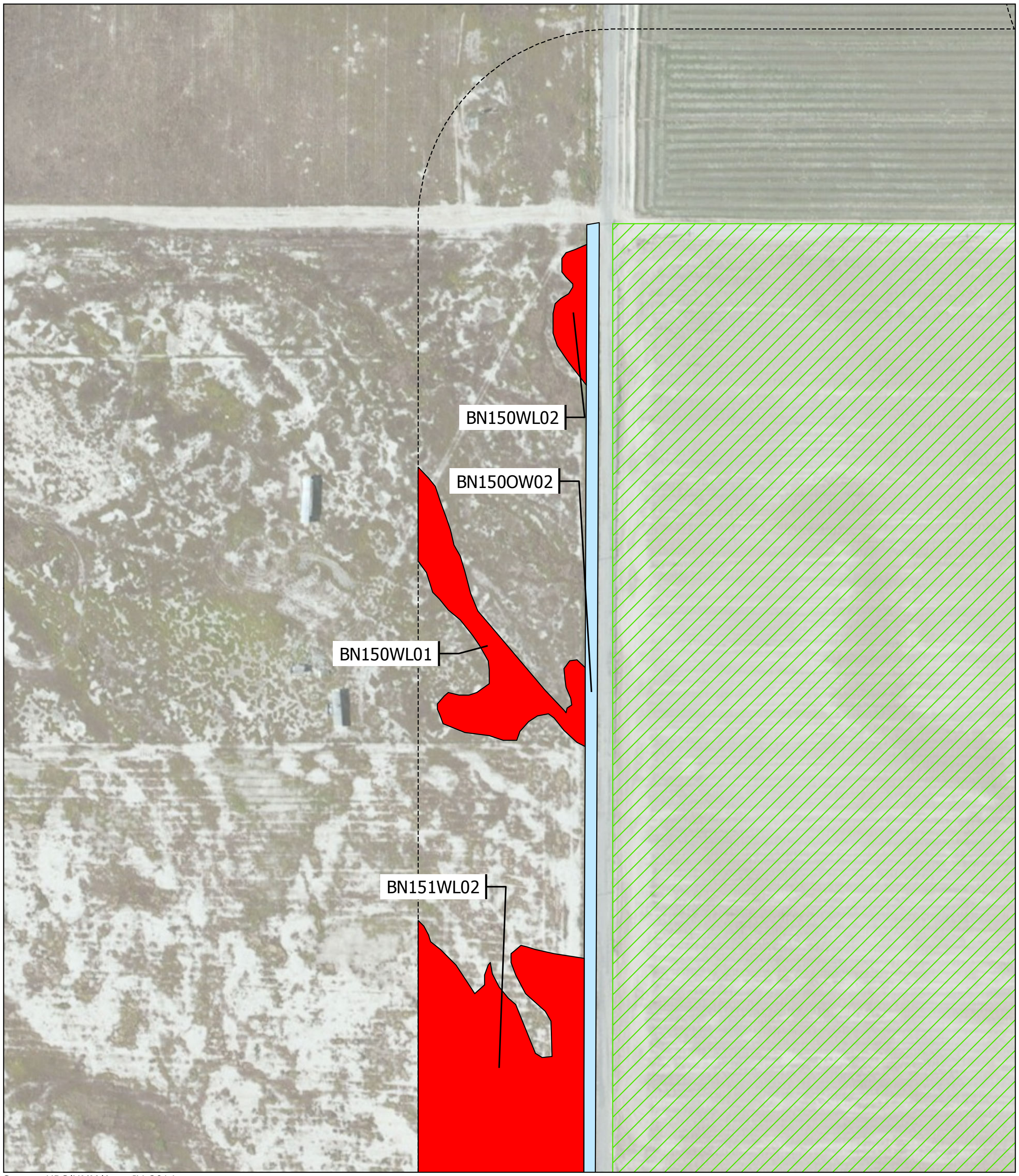


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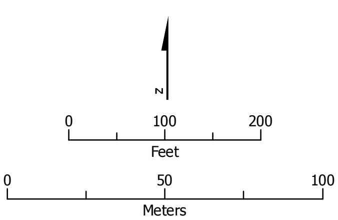
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

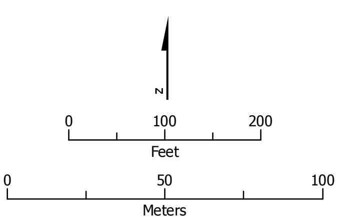
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

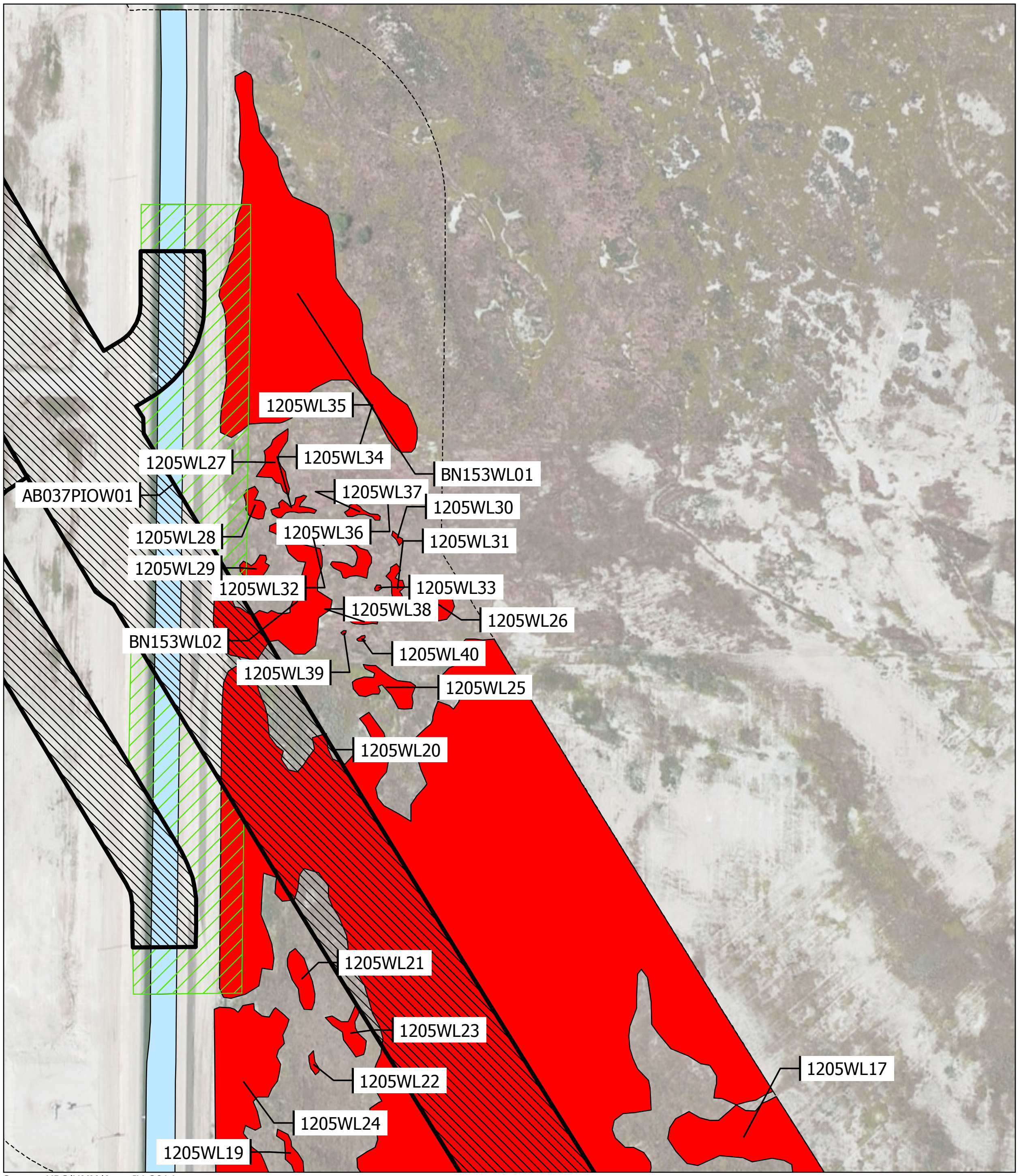
Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



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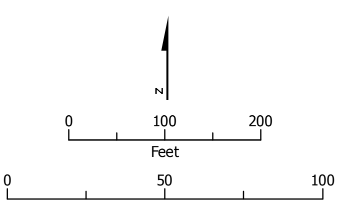

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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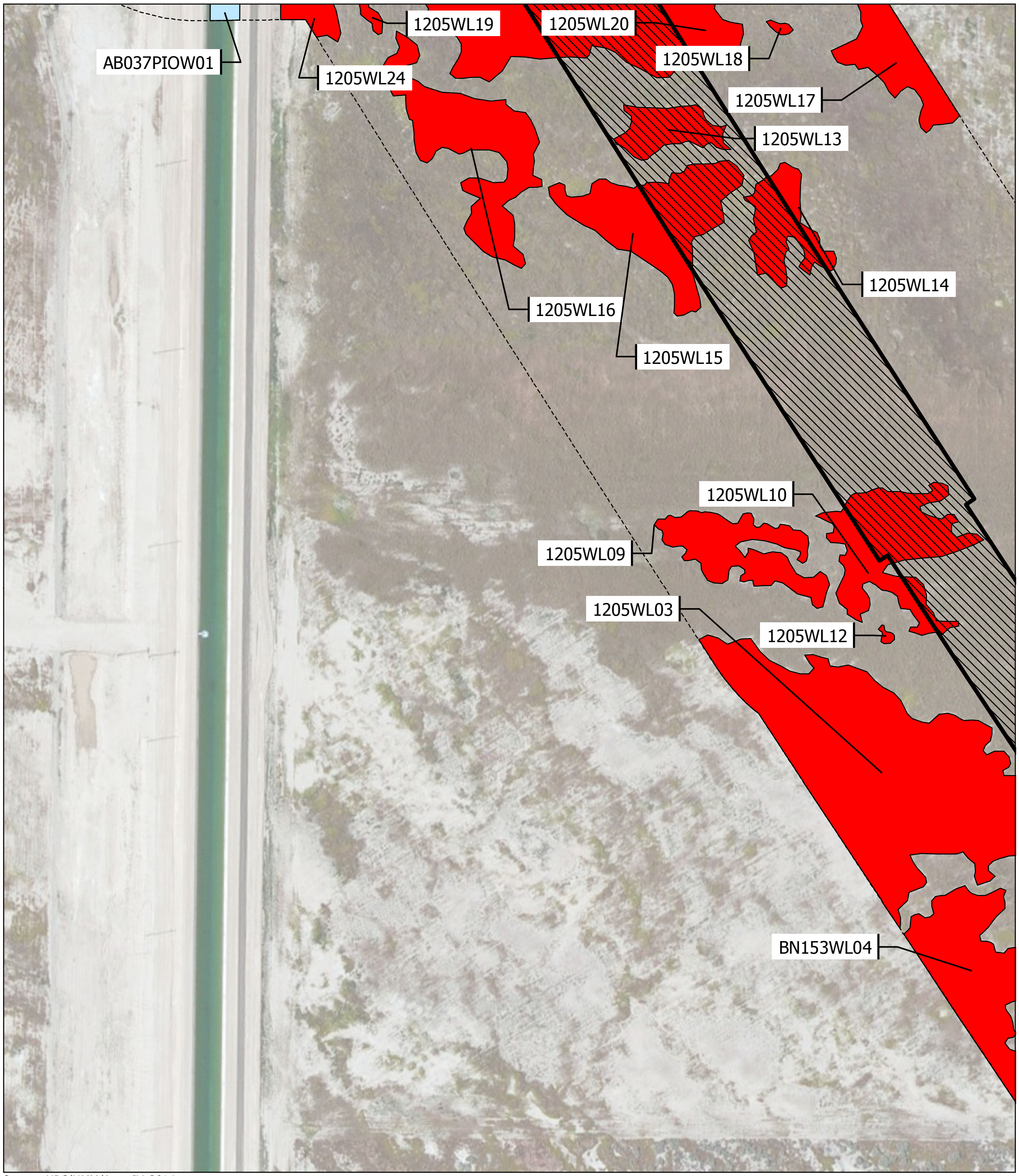

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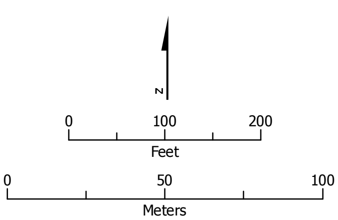
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

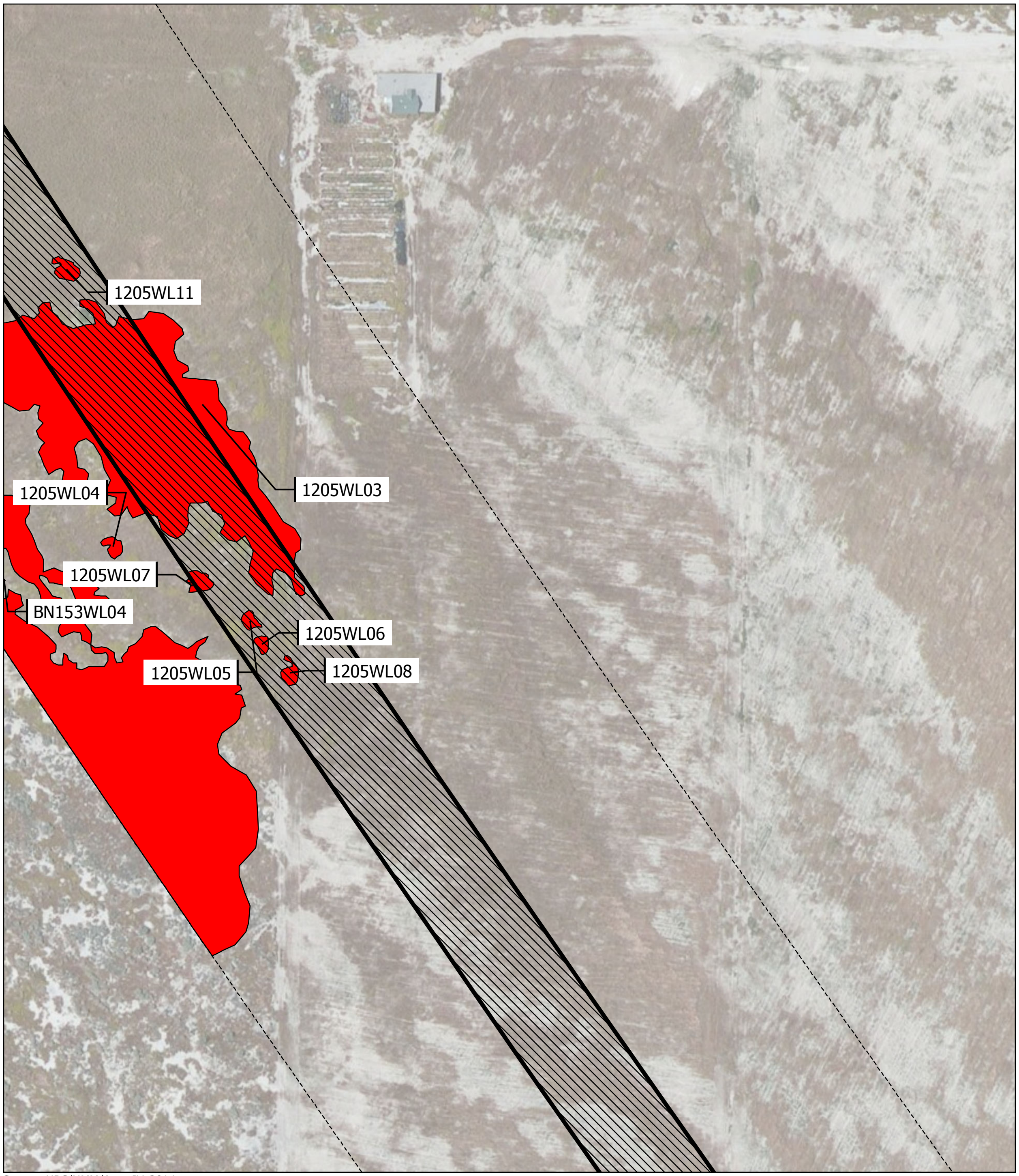


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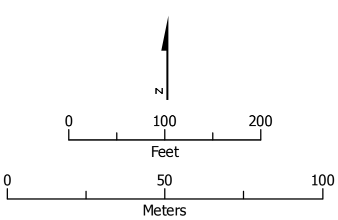
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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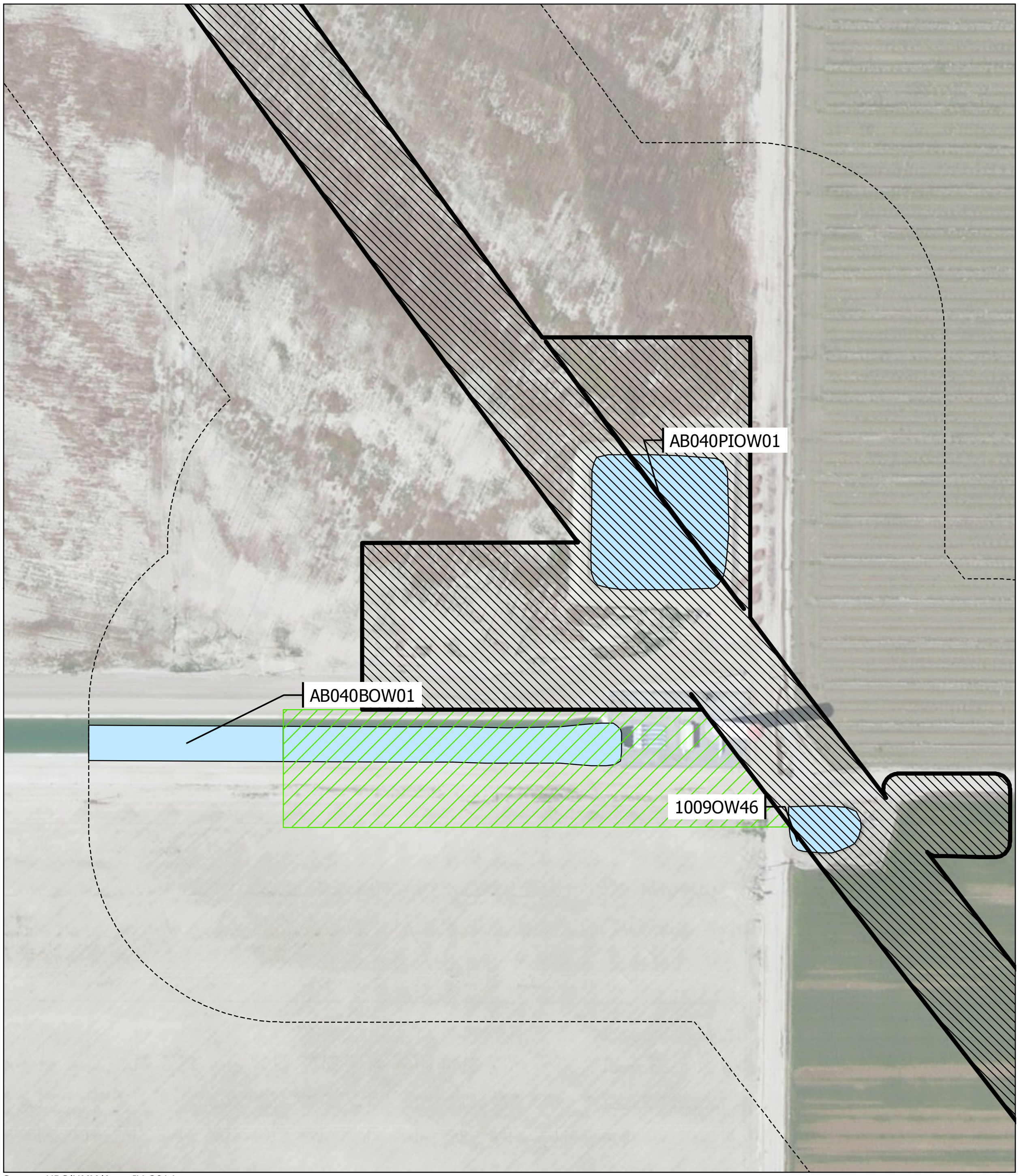

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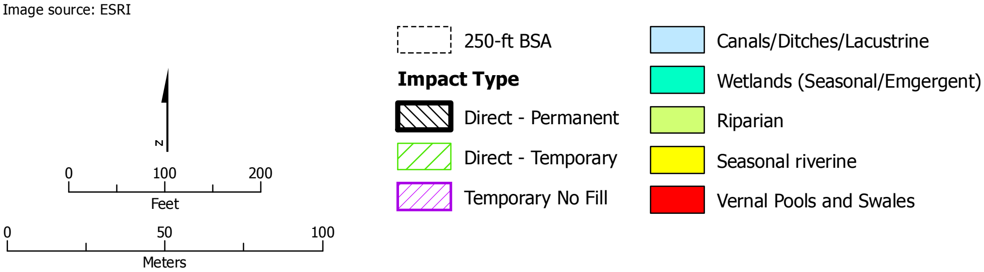
January 22, 2014



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Project Impact Mapbook

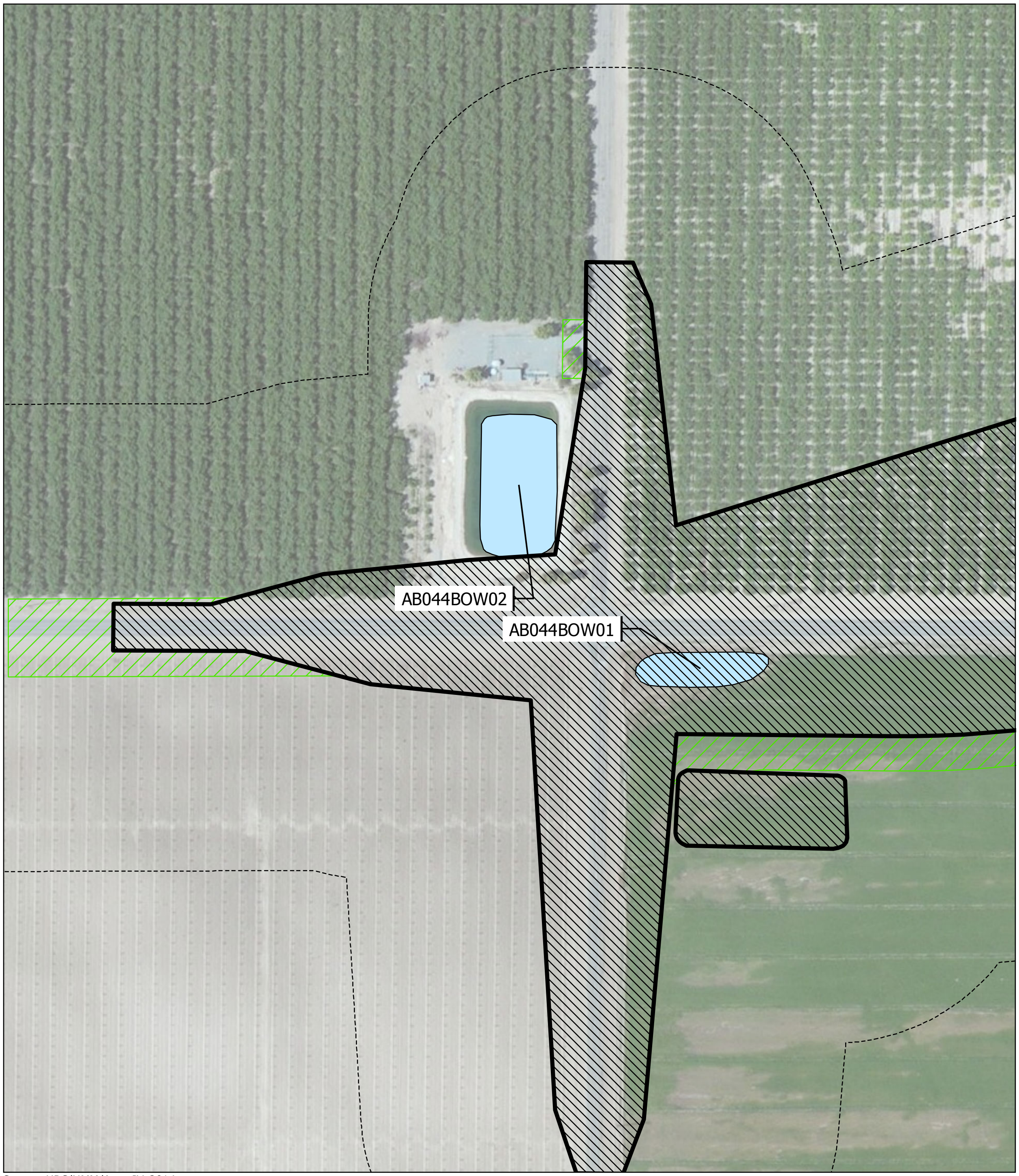

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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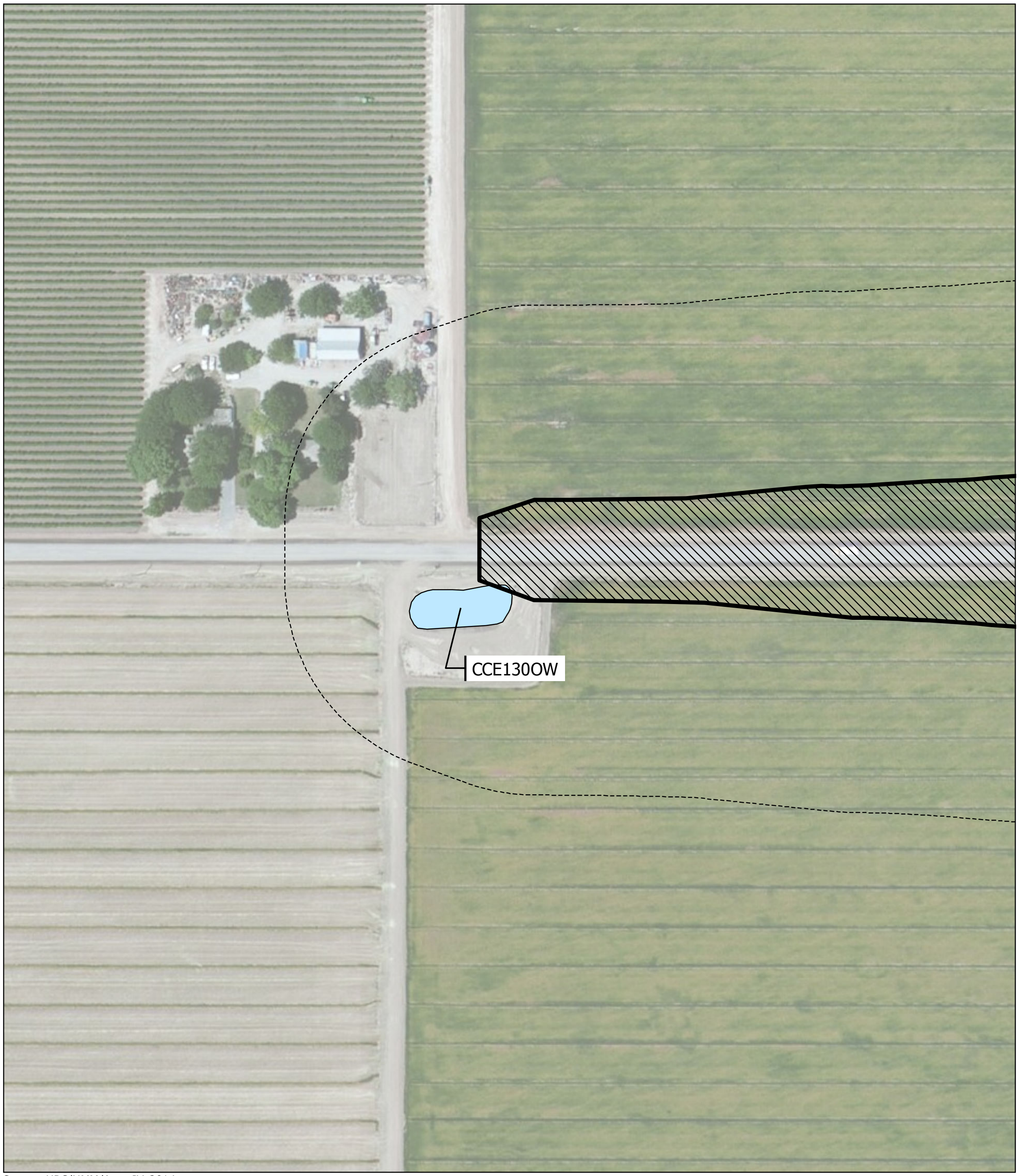

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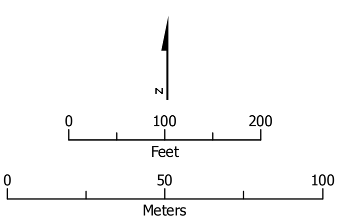
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
Page 203 of 246

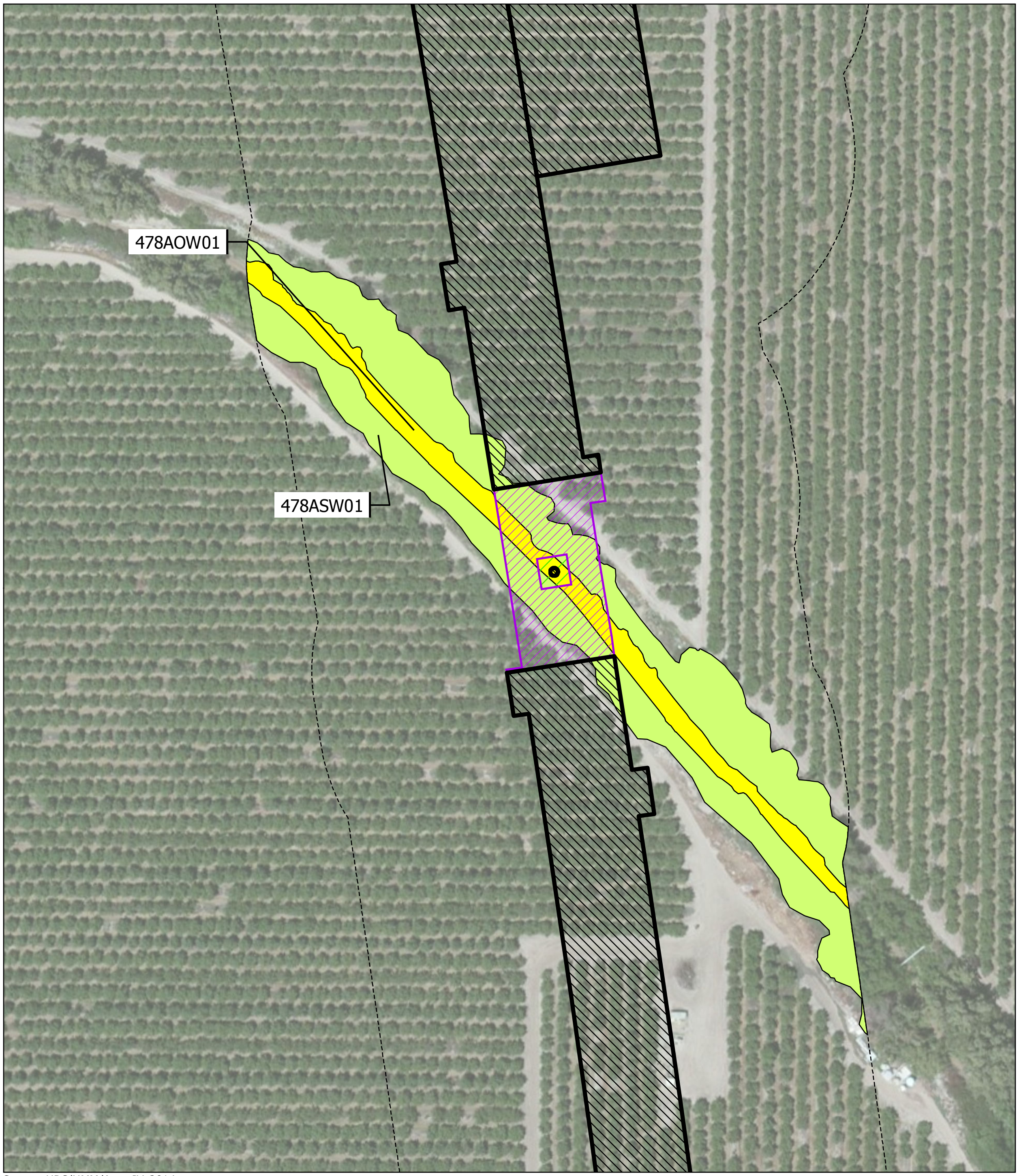


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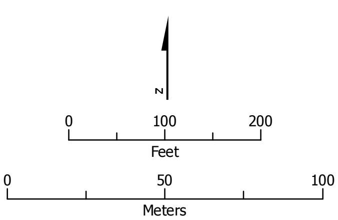
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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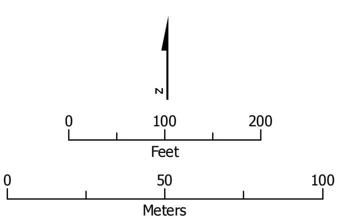
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

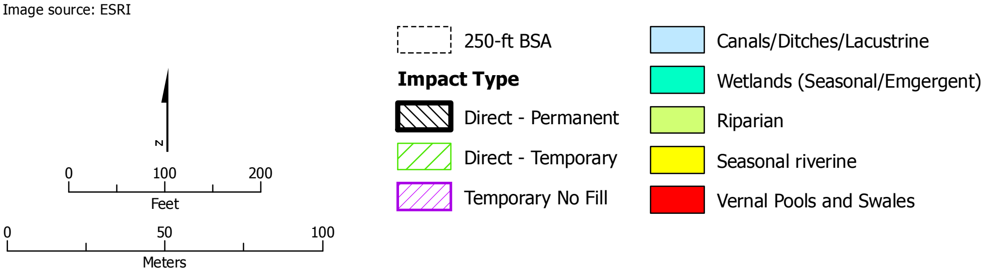
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

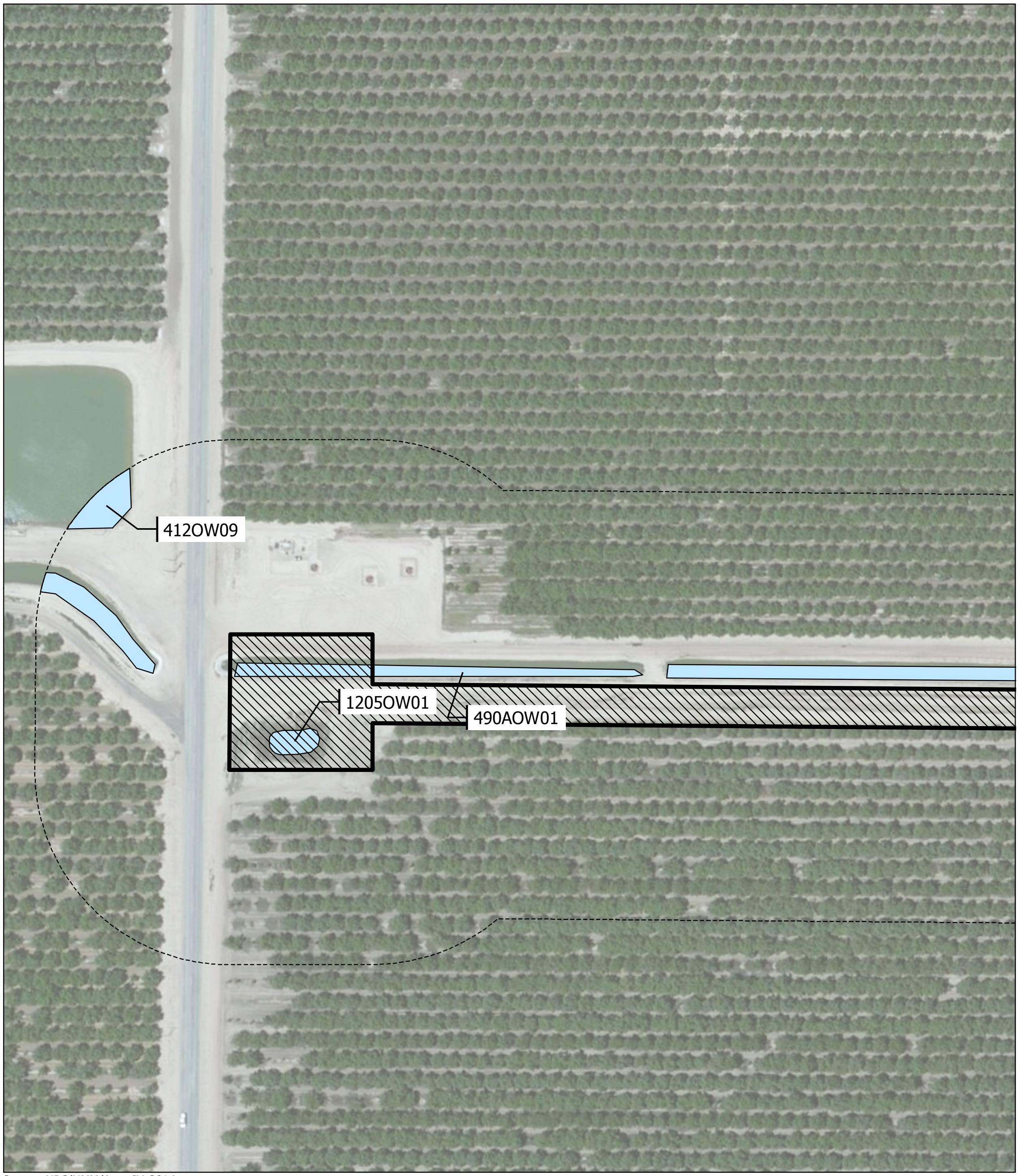


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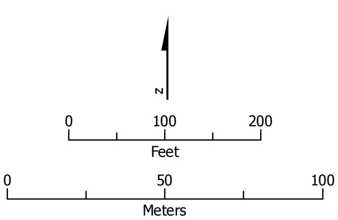
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

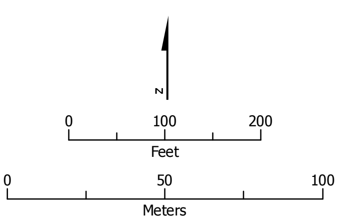
Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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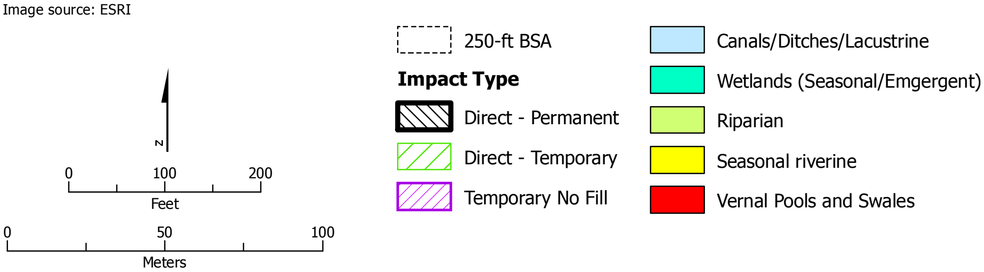
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

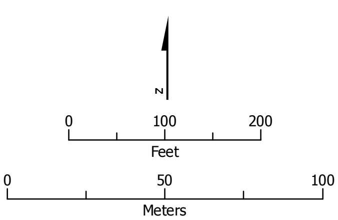
January 22, 2014



Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

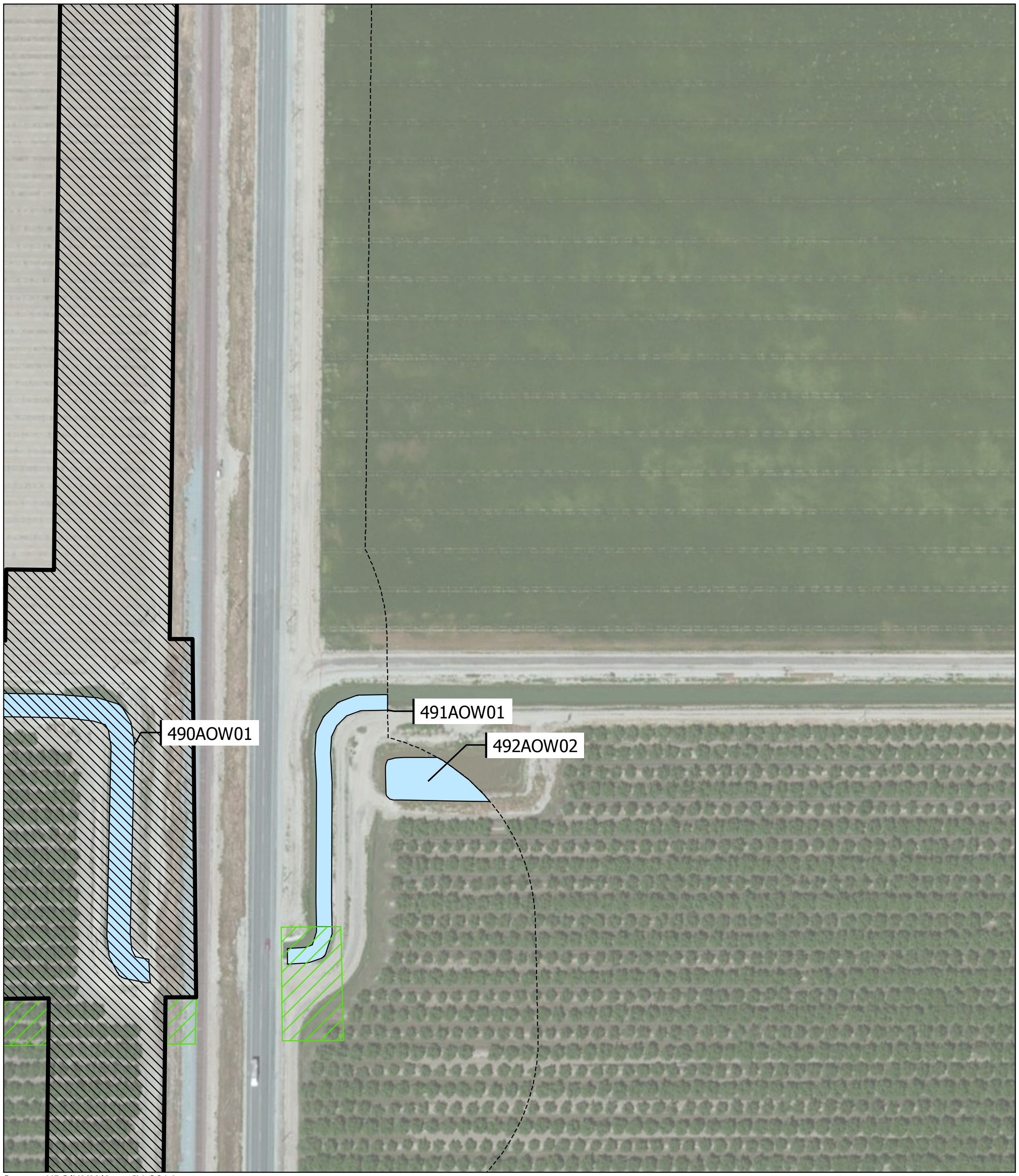
Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

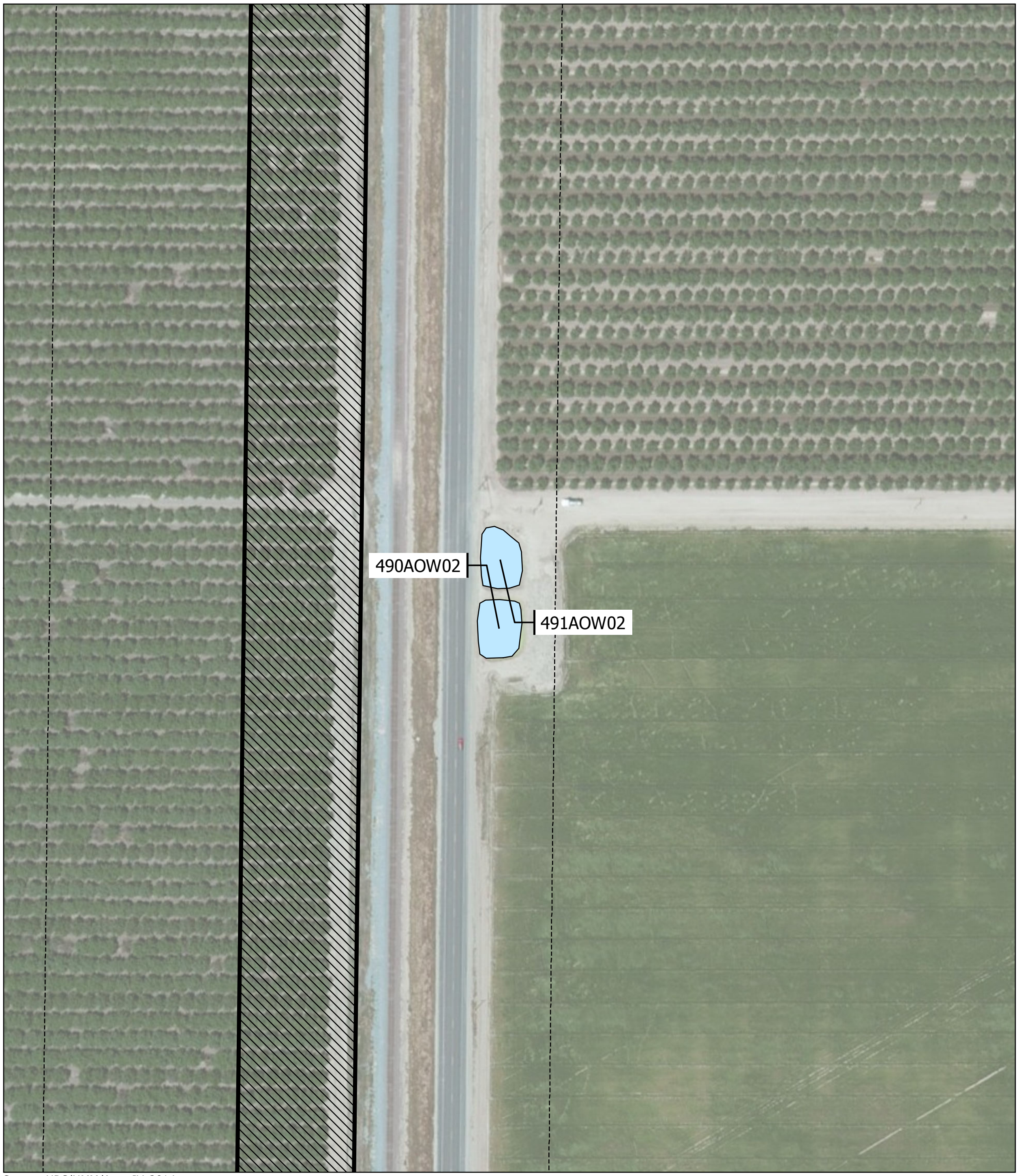
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



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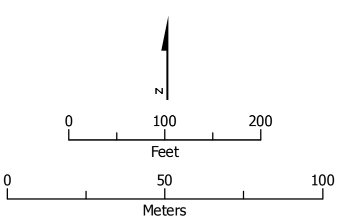


250-ft BSA

Impact Type

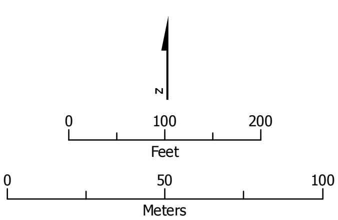
Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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Appendix 4
Project Impact Mapbook
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Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

N

0 100 200
Feet

0 50 100
Meters

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

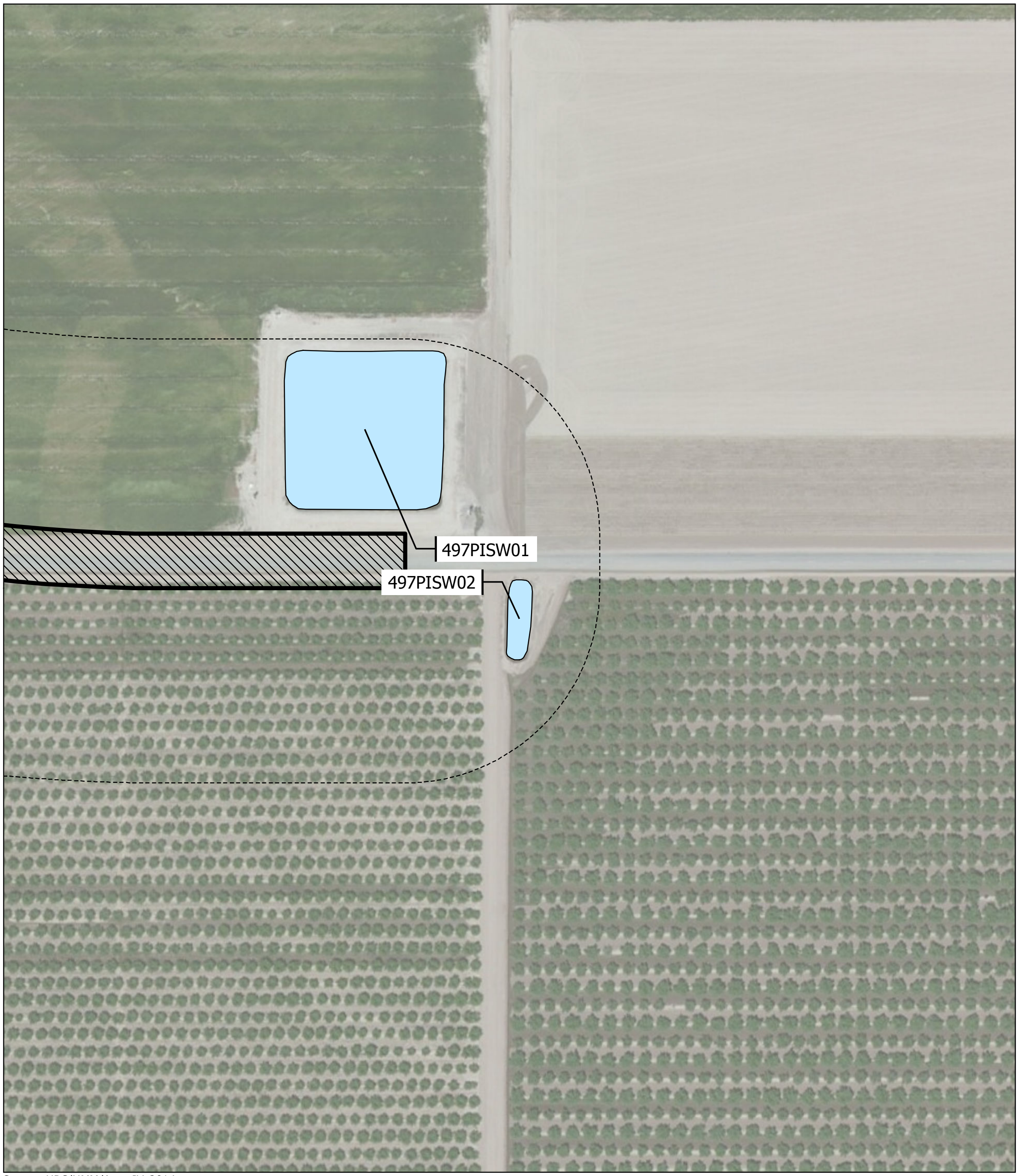

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

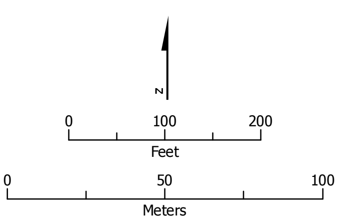
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
Page 216 of 246

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emgergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

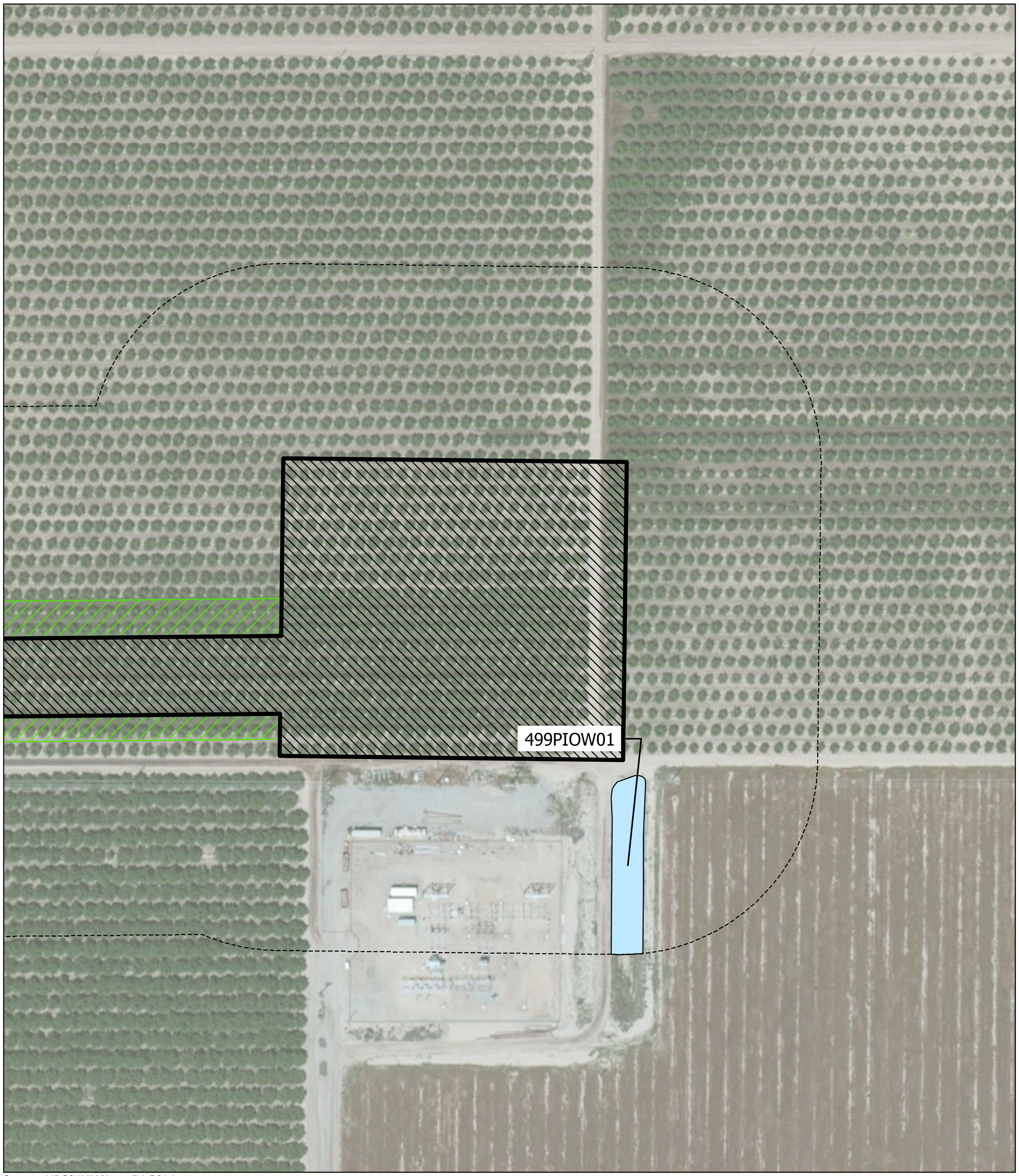


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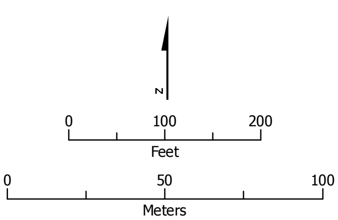
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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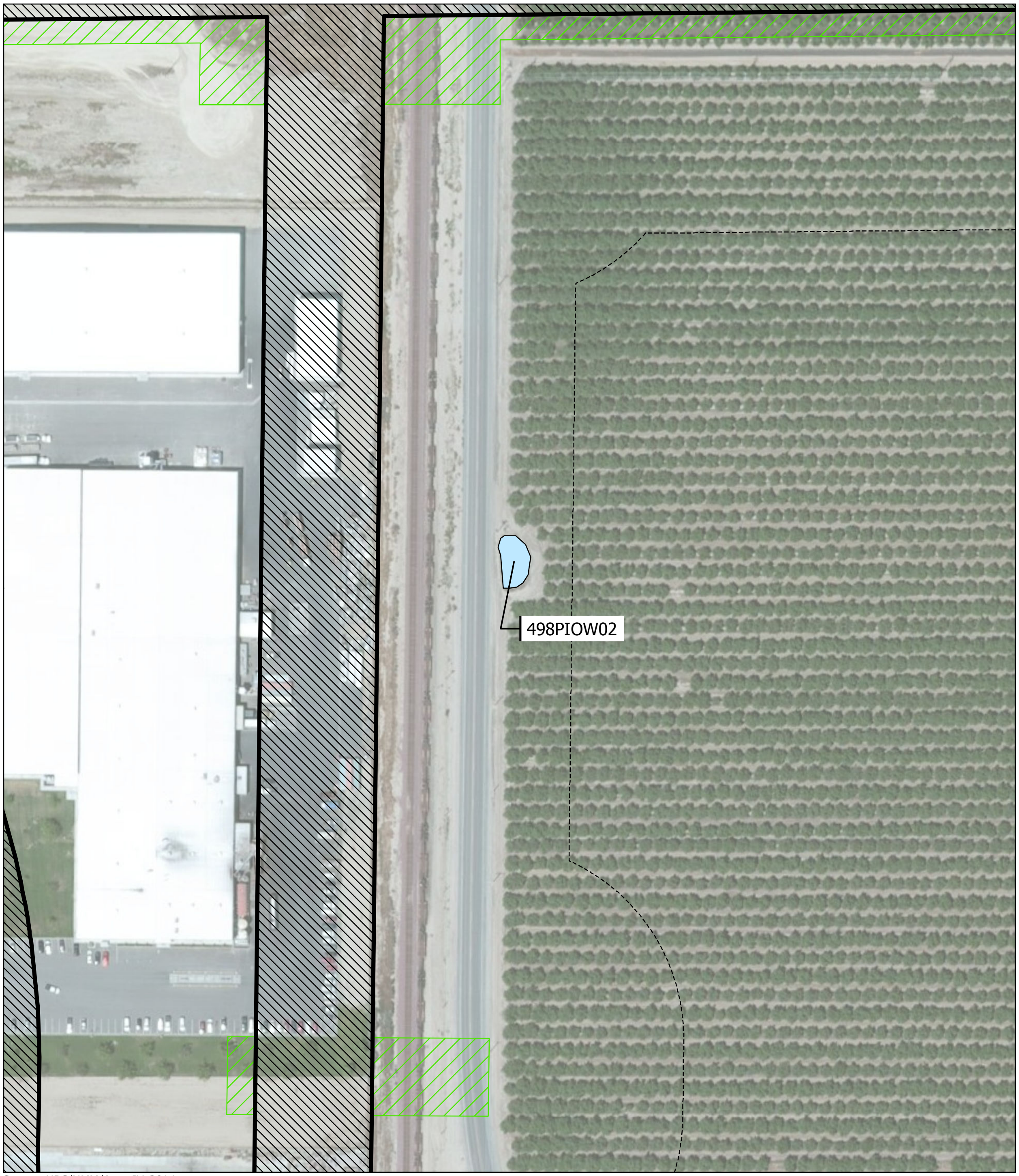

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

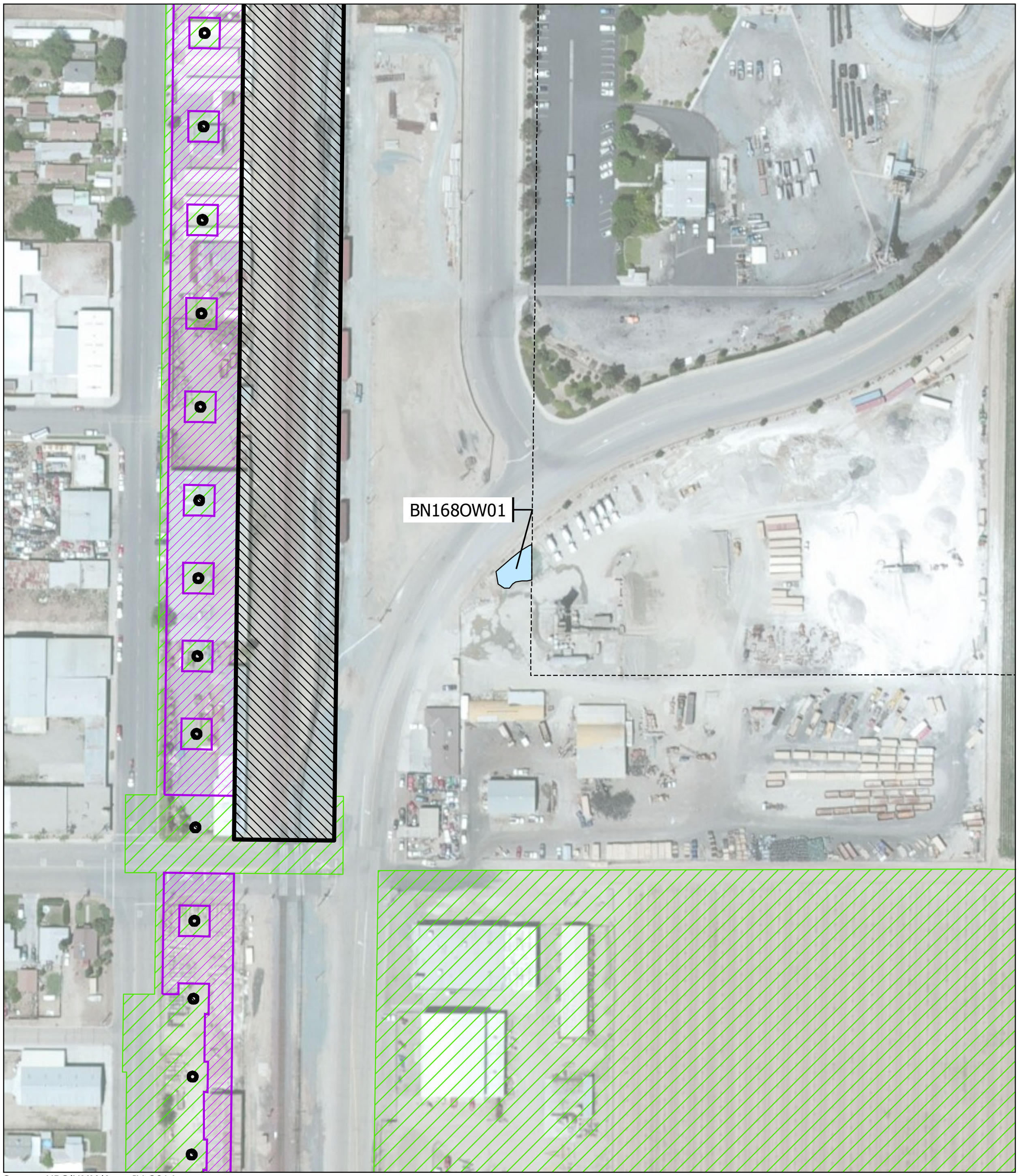

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

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Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
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January 22, 2014

250-ft BSA

Impact Type

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Direct - Temporary

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Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

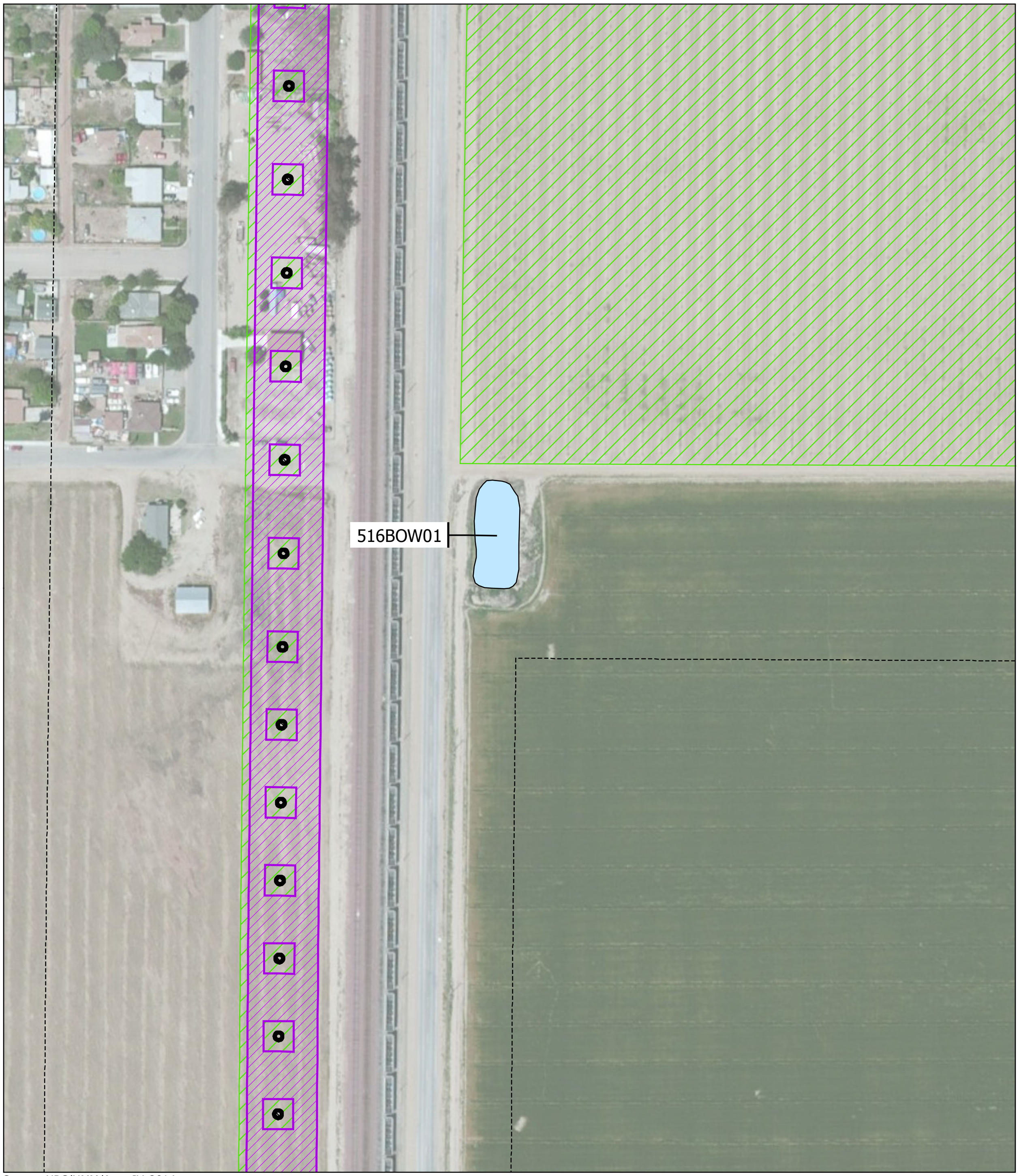

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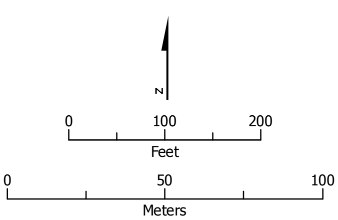
Image source: ESRI

January 22, 2014



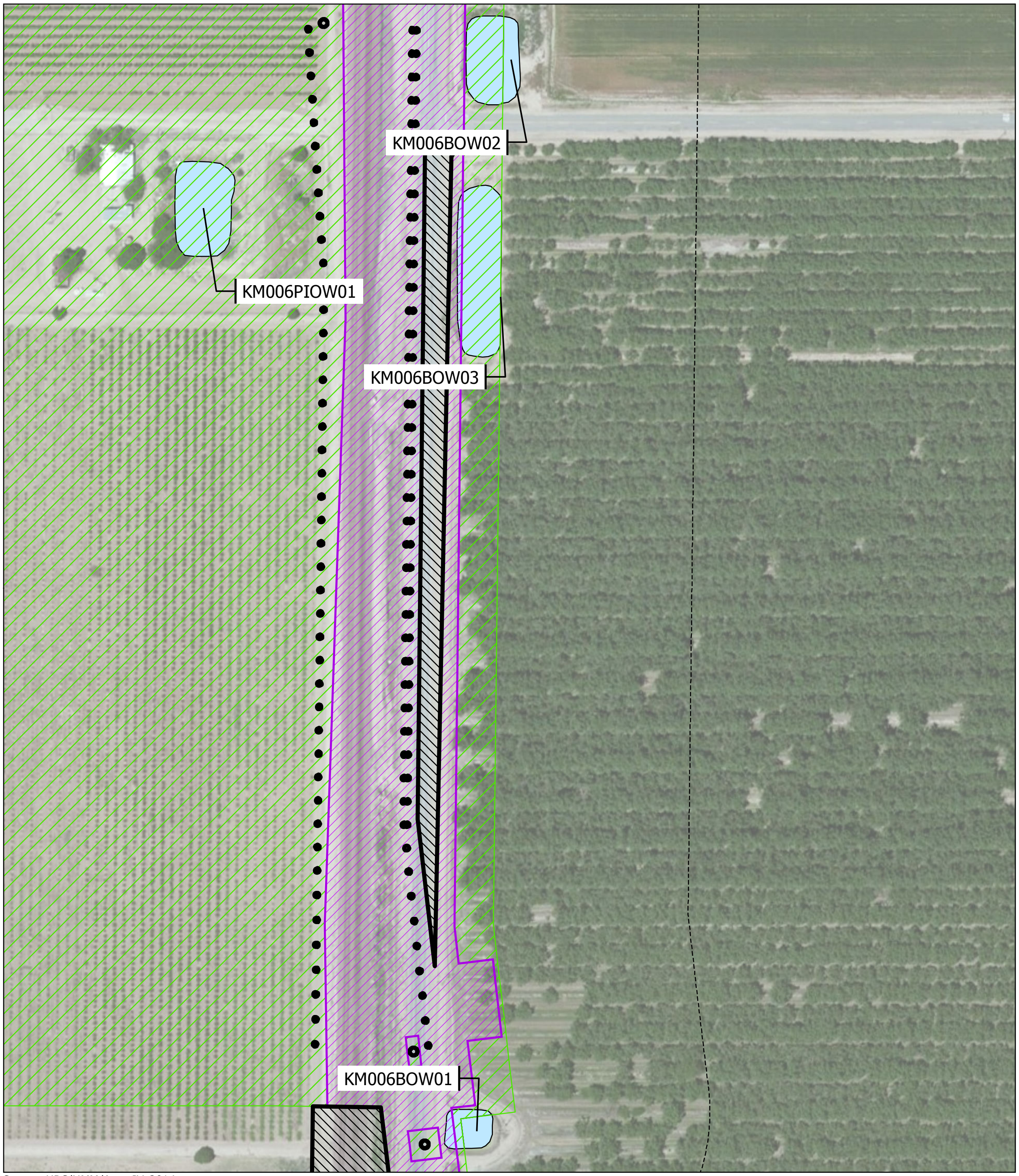
250-ft BSA

Impact Type

- Direct - Permanent
- Direct - Temporary
- Temporary No Fill

- Canals/Ditches/Lacustrine
- Wetlands (Seasonal/Emergent)
- Riparian
- Seasonal riverine
- Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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Project Impact Mapbook
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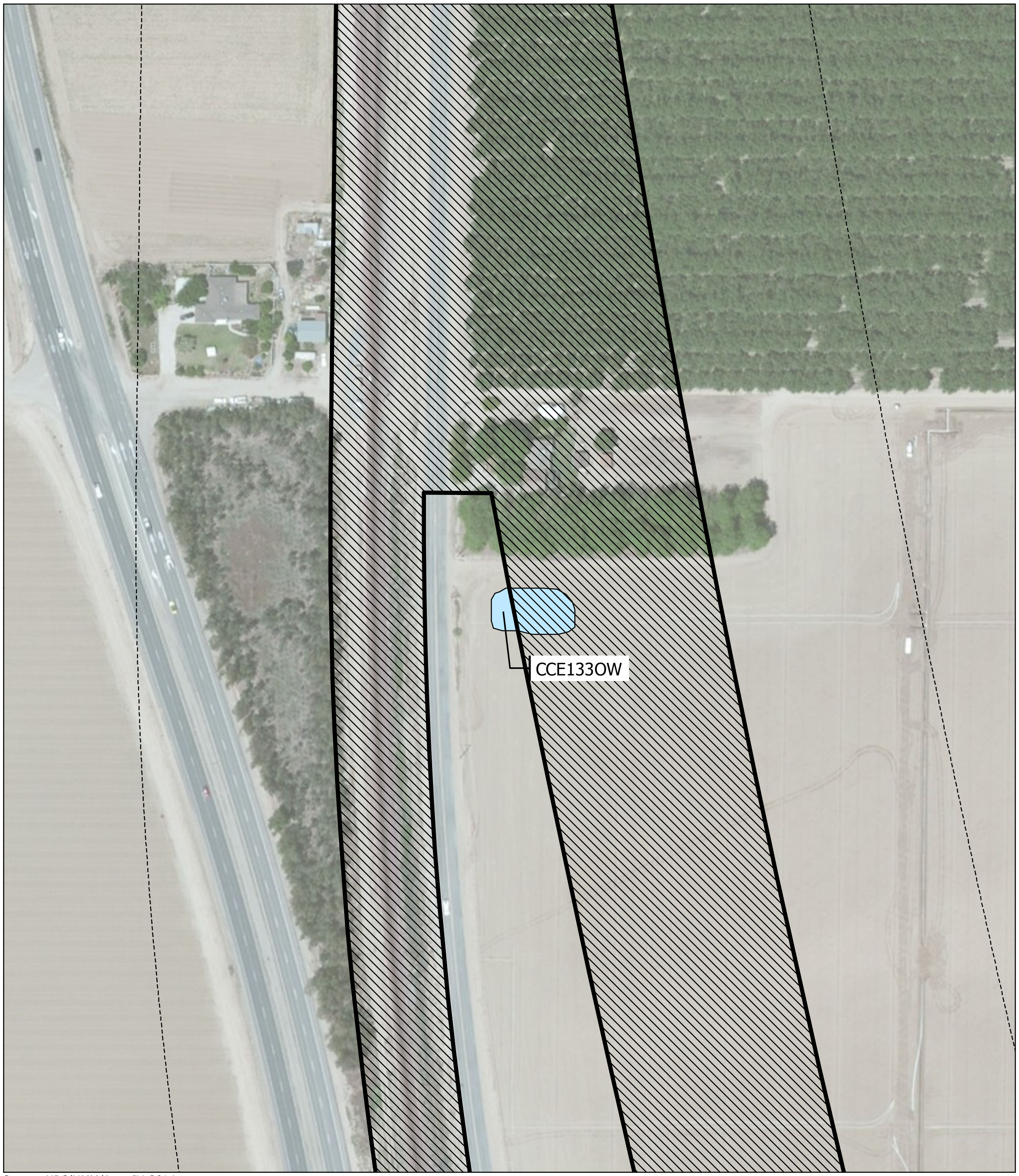

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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

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Project Impact Mapbook
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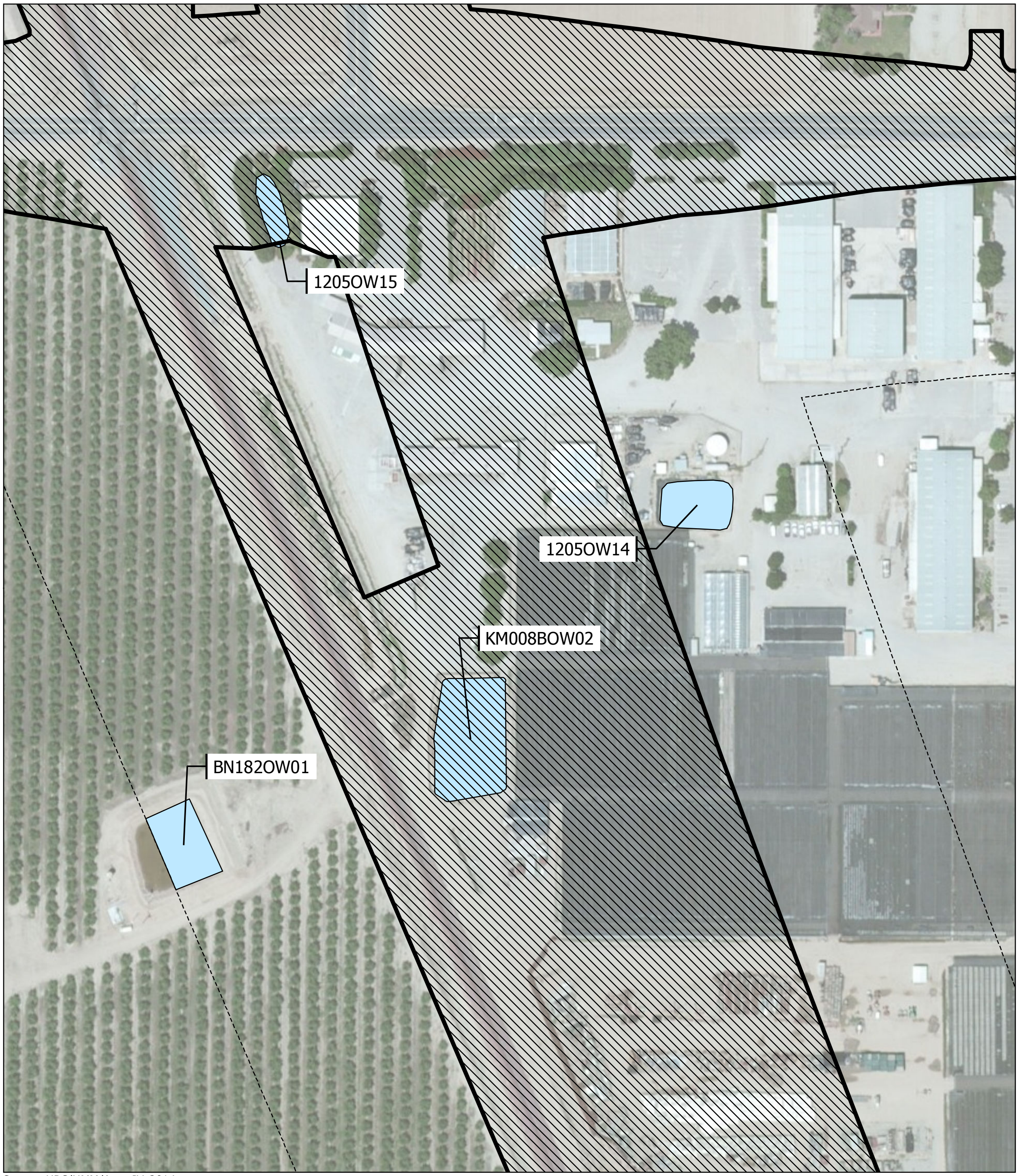

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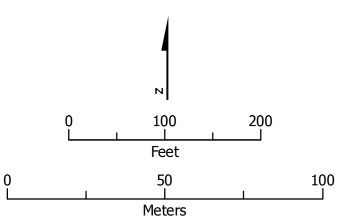


250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

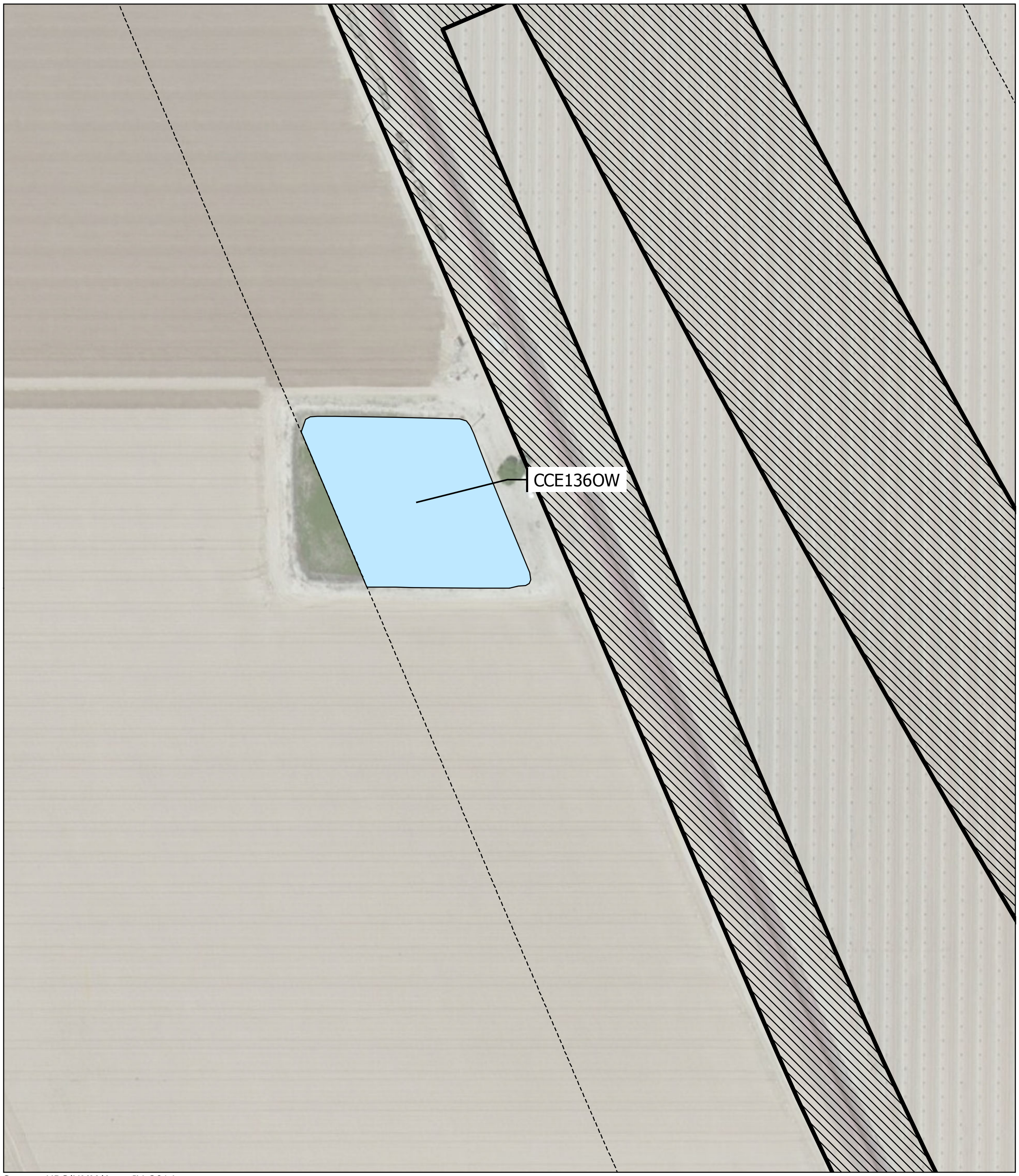
Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

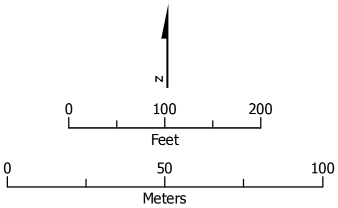
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

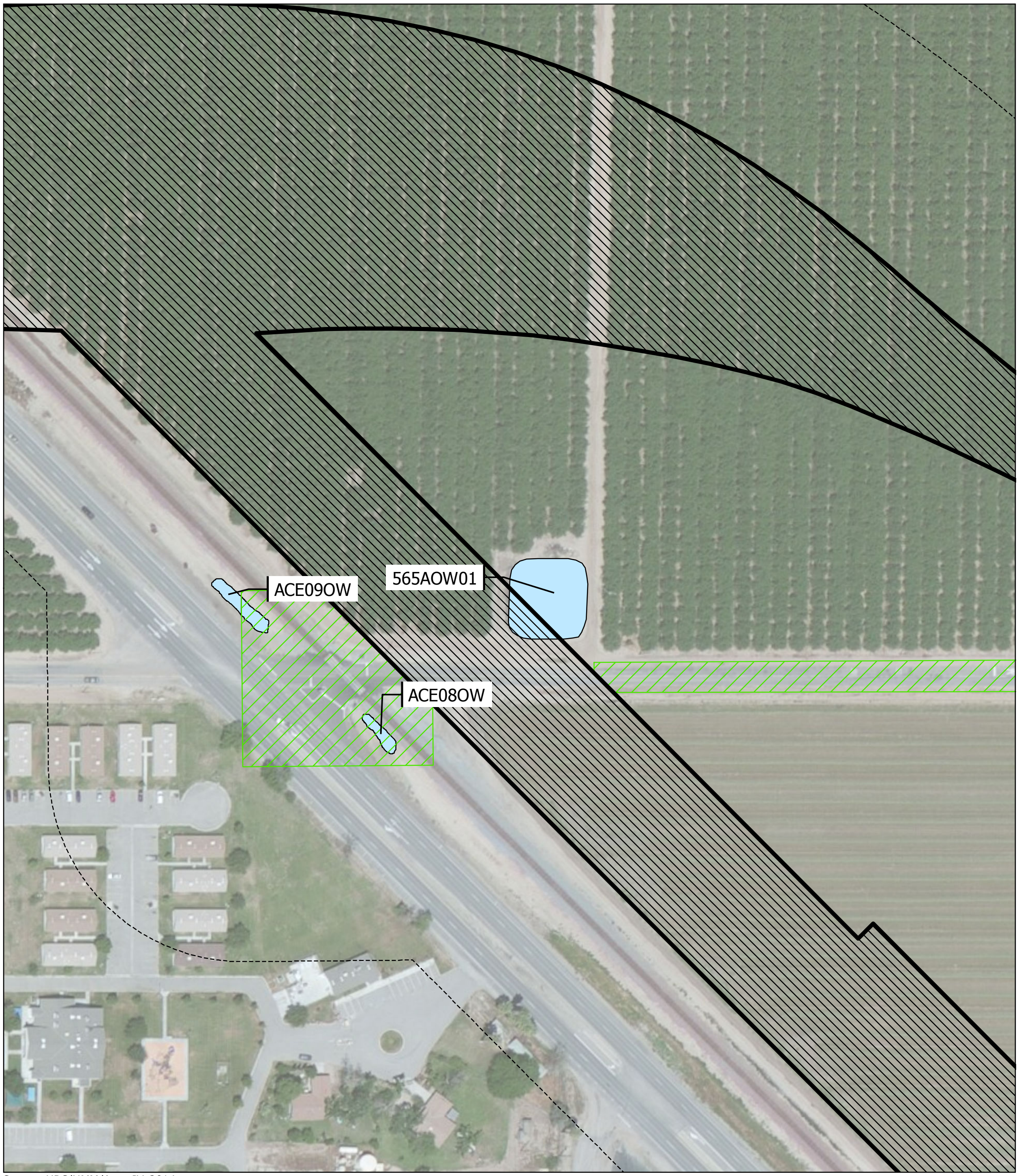


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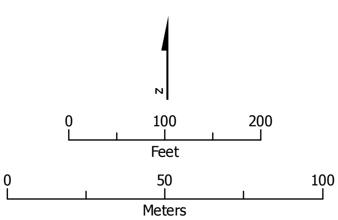
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook
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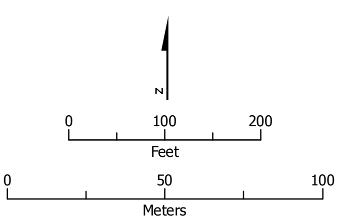
Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

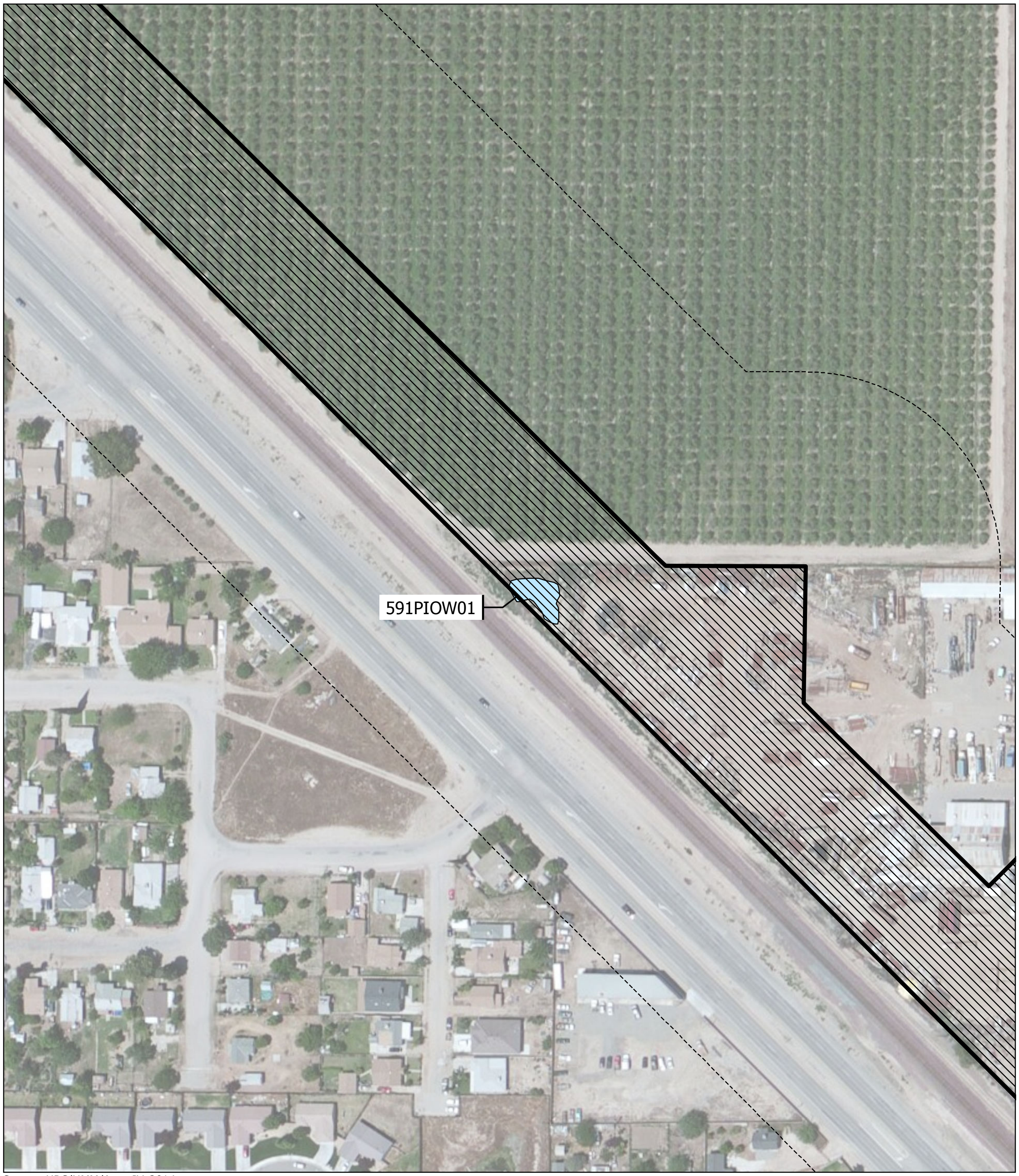


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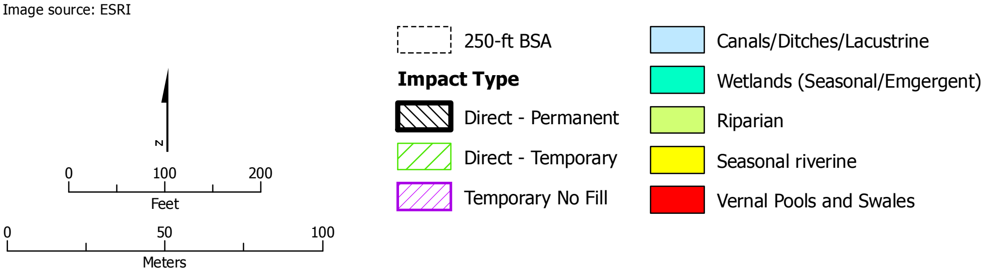
Image source: ESRI

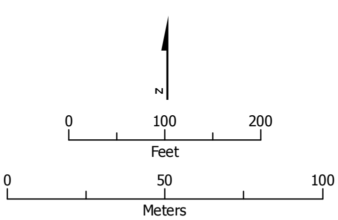
January 22, 2014



Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emgergent)

Riparian

Seasonal riverine

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Project Impact Mapbook
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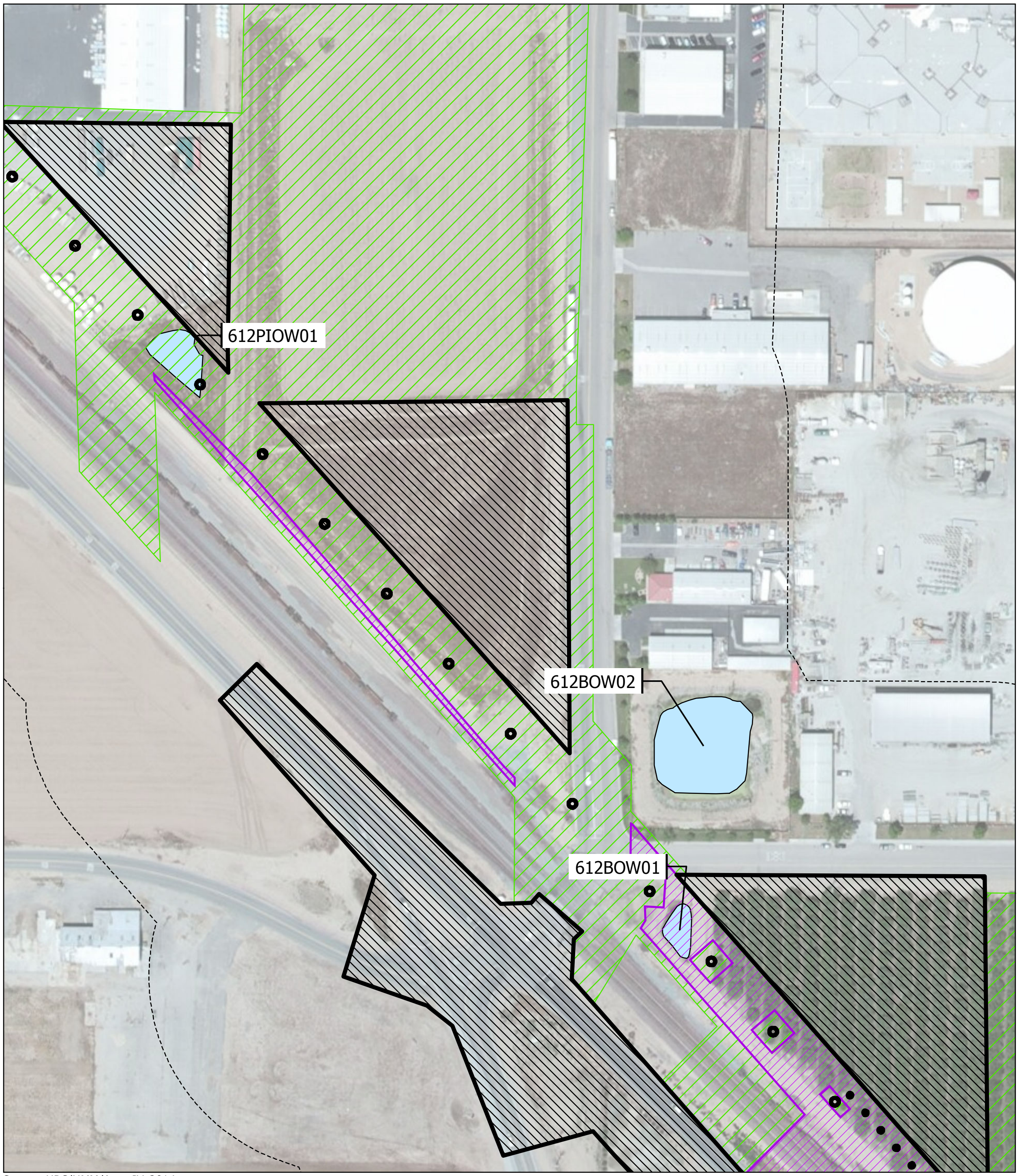

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent
Direct - Temporary
Temporary No Fill

Canals/Ditches/Lacustrine
Wetlands (Seasonal/Emergent)
Riparian
Seasonal riverine
Vernal Pools and Swales

N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook
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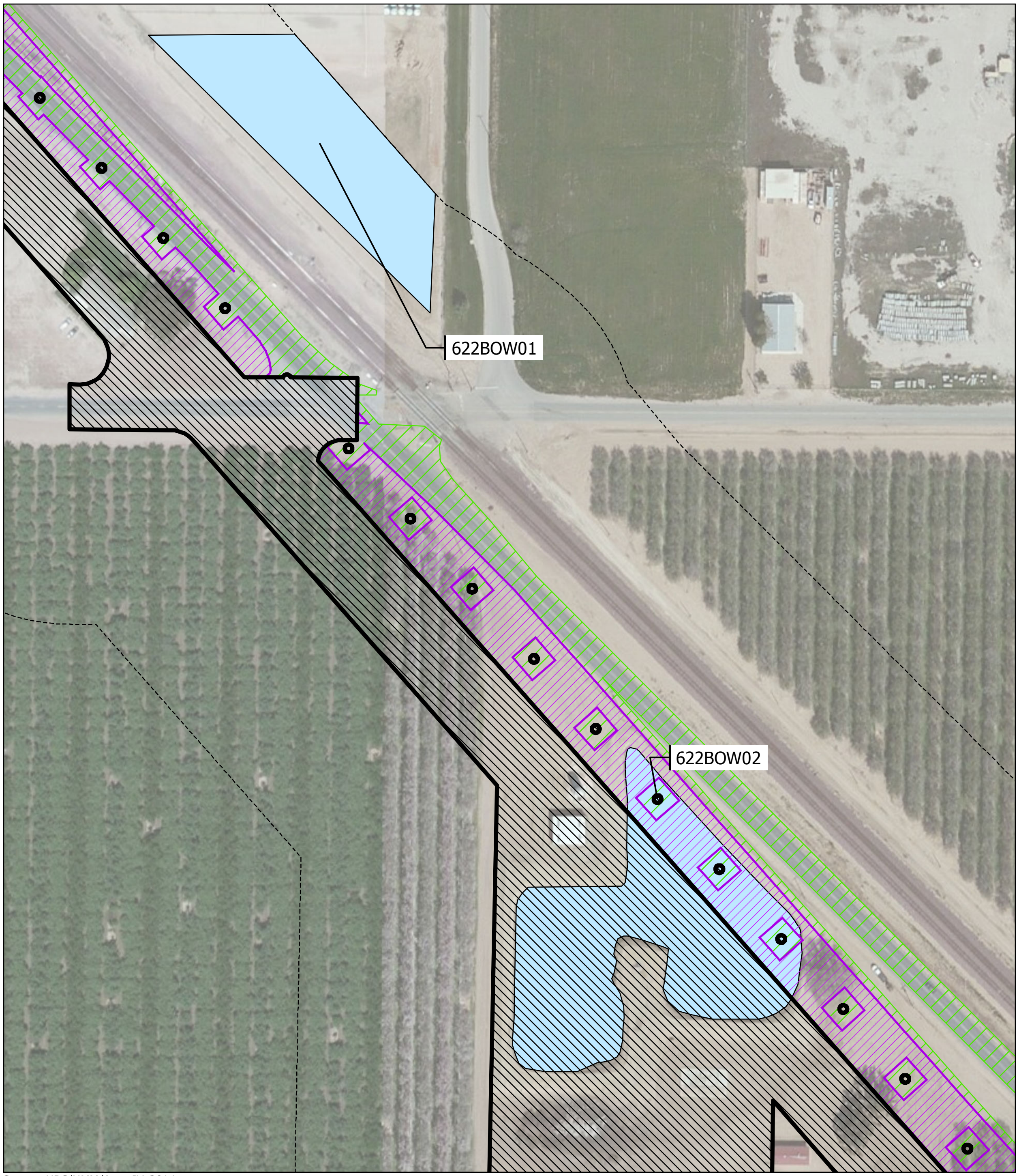

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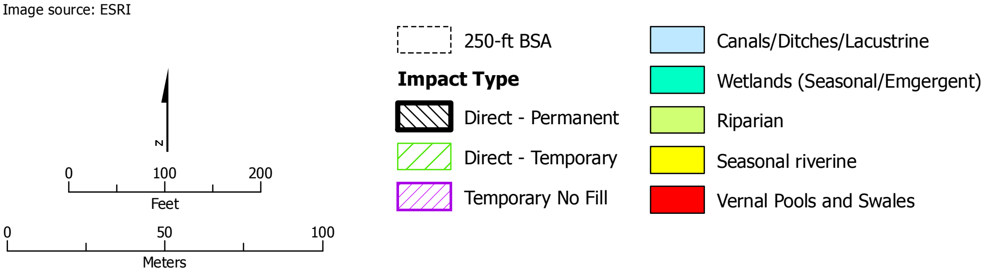
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

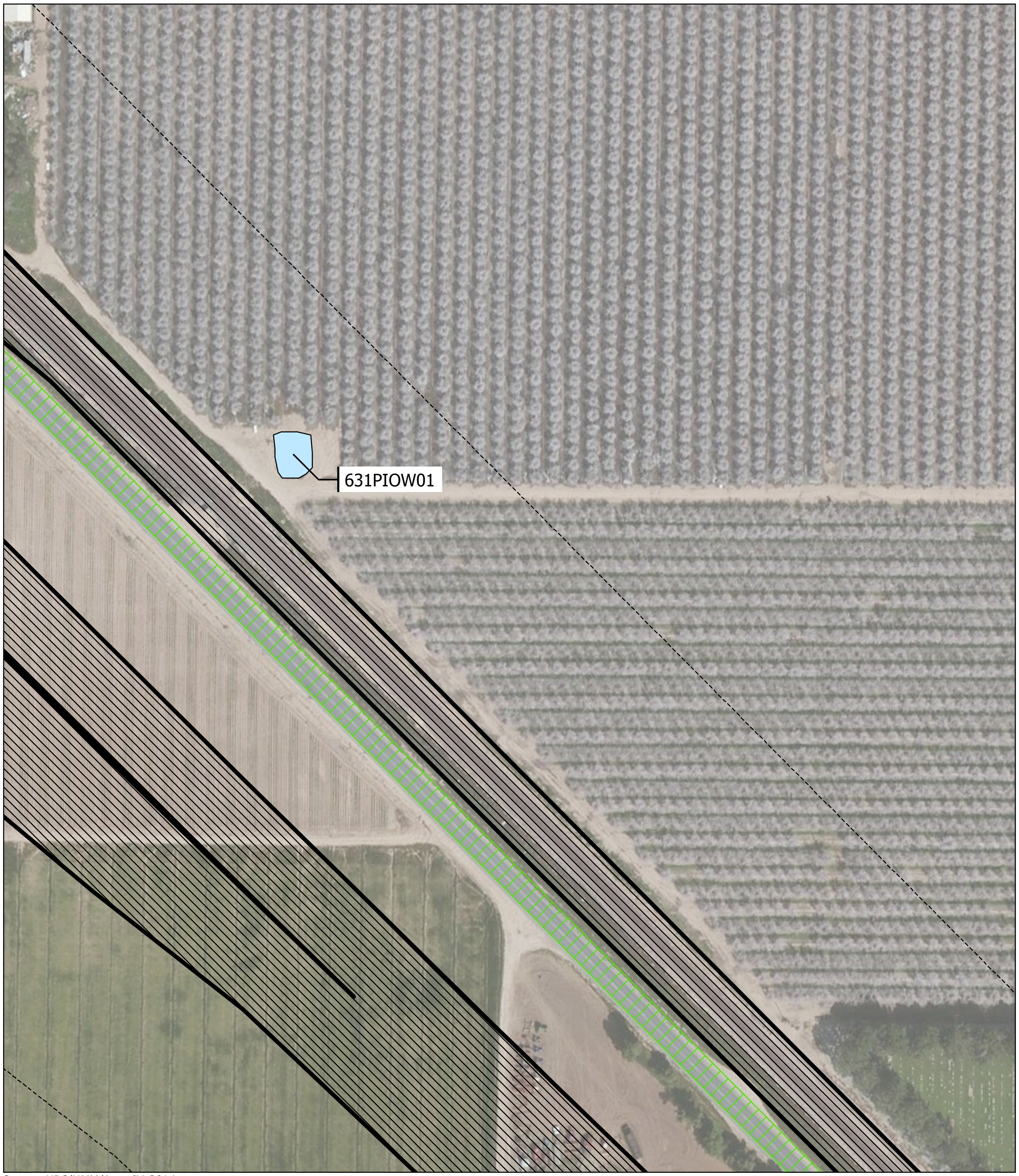


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Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

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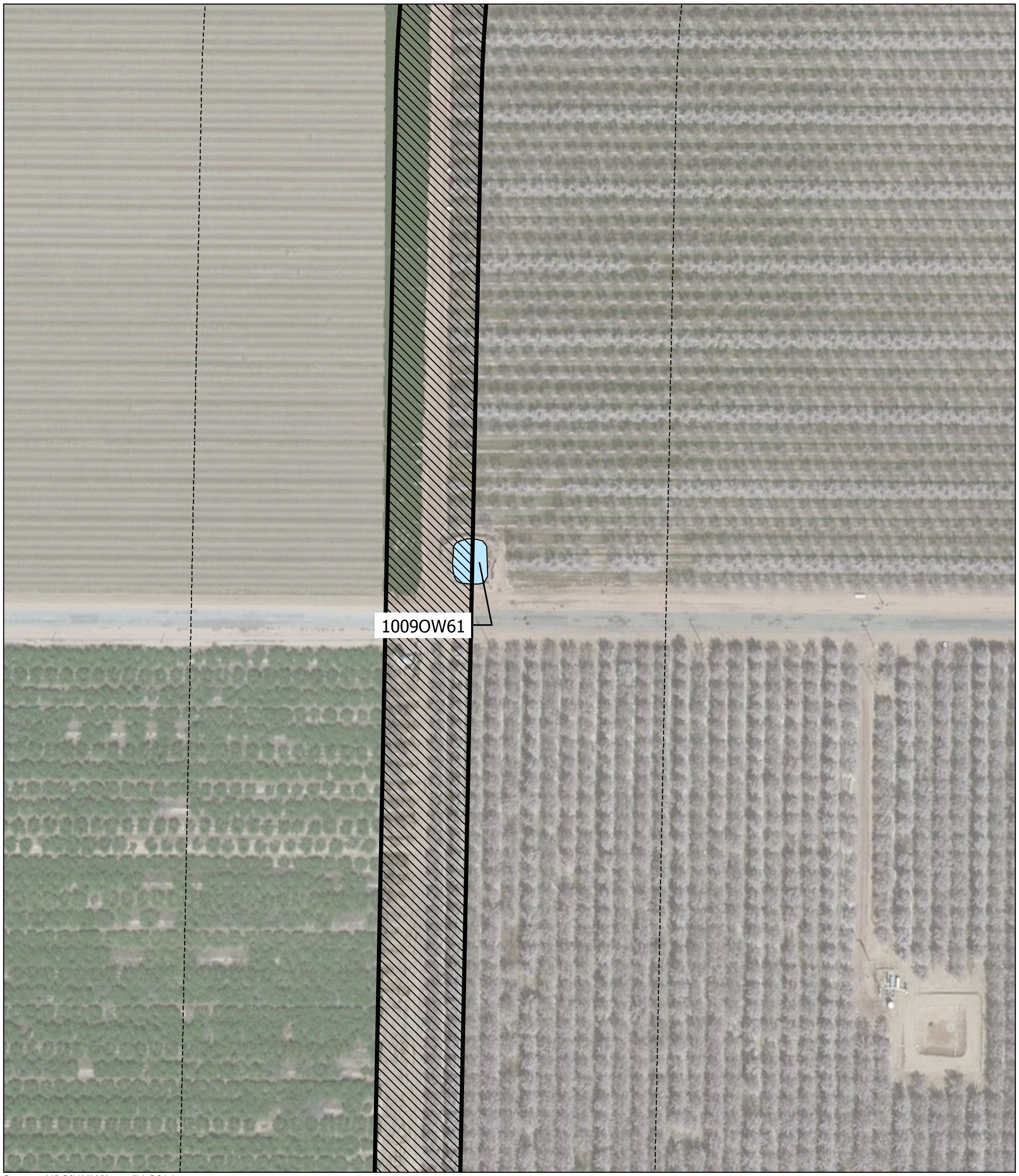
N

0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook



Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014

250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

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N

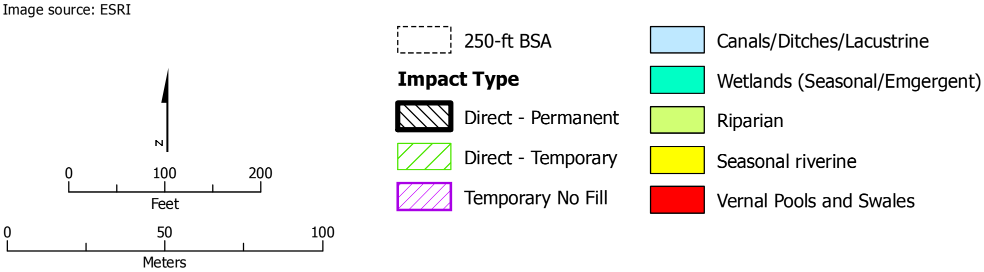
0 100 200
Feet

0 50 100
Meters

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
Image source: ESRI

January 22, 2014



Appendix 4
Project Impact Mapbook

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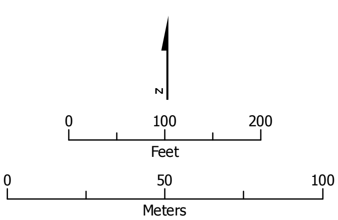
January 22, 2014



250-ft BSA

Impact Type

Direct - Permanent

Direct - Temporary

Temporary No Fill

Canals/Ditches/Lacustrine

Wetlands (Seasonal/Emergent)

Riparian

Seasonal riverine

Vernal Pools and Swales

Appendix 4
Project Impact Mapbook

Source: URS/HMM/Arup JV, 2014.
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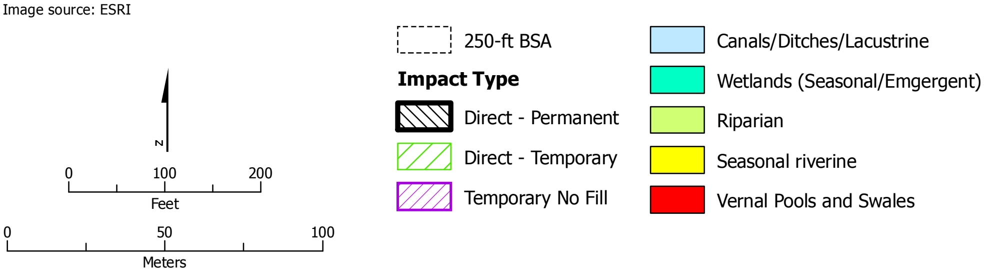
January 22, 2014



Appendix 4
Project Impact Mapbook

Appendix 5:
Section 404 Impact Tables

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
027AOW03	Canals/Ditches	0.04	491.47	N/A	0.00	36.69702	-119.7589	Upper Dry	CP1C
031FOW01	Canals/Ditches	0.05	694.40	N/A	0.19	36.6864	-119.7536	Upper Dry	CP1C
031FOW05	Lacustrine	0.00	0.00	N/A	0.43	36.68214	-119.7539	Upper Dry	CP1C
034EOW01	Lacustrine	0.06	926.30	N/A	0.59	36.67851	-119.7542	Upper Dry	CP1C
034EOW02	Canals/Ditches	0.24	3143.33	N/A	0.56	36.67793	-119.7504	Upper Dry	CP1C
034EOW04	Canals/Ditches	0.00	0.00	N/A	0.37	36.67946	-119.7537	Upper Dry	CP1C
034PIOW01	Canals/Ditches	0.03	352.34	N/A	0.36	36.67911	-119.7525	Upper Dry	CP1C
035DOW01	Canals/Ditches	0.00	0.00	N/A	0.47	36.68199	-119.7504	Upper Dry	CP1C
036DOW01	Canals/Ditches	0.07	852.64	N/A	0.01	36.66621	-119.7512	Upper Dry	CP1C
037EOW02	Canals/Ditches	0.00	0.00	N/A	0.01	36.66621	-119.7495	Upper Dry	CP1C
042EOW01	Canals/Ditches	0.14	1837.87	N/A	0.04	36.65251	-119.7519	Upper Dry	CP 2/3
043DOW01	Canals/Ditches	0.02	245.36	N/A	0.00	36.64988	-119.7504	Upper Dry	CP 2/3
046DOW02	Canals/Ditches	0.10	1319.13	N/A	0.00	36.64364	-119.7507	Upper Dry	CP 2/3
047COW01	Canals/Ditches	0.10	1239.65	N/A	0.02	36.63927	-119.7514	Upper Dry	CP 2/3
052BOW01	Canals/Ditches	1.01	12997.58	N/A	0.04	36.62002	-119.7525	Upper Dry	CP 2/3
061COW01	Lacustrine	0.03	493.39	N/A	0.00	36.57917	-119.7463	Upper Dry	CP 2/3
064COW01	Canals/Ditches	0.05	645.46	N/A	0.00	36.57673	-119.746	Upper Dry	CP 2/3
064COW02	Canals/Ditches	0.08	992.73	N/A	0.00	36.57673	-119.7455	Upper Dry	CP 2/3
067BOW01	Canals/Ditches	0.11	1426.11	N/A	0.02	36.56322	-119.7422	Upper Dry	CP 2/3
070BOW01	Canals/Ditches	0.09	1201.06	N/A	0.03	36.55734	-119.7388	Upper Dry	CP 2/3
073BOW01	Canals/Ditches	0.66	8576.17	N/A	0.71	36.54901	-119.733	Upper Dry	CP 2/3
1009OW46	Lacustrine	0.11	1699.02	N/A	0.00	35.73196	-119.3746	Upper Deer-Upper White	CP 4 @ 7th Standard
1009OW61	Lacustrine	0.03	484.65	N/A	0.00	35.47096	-119.2519	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
1029OW01	Canals/Ditches	0.00	32.34	N/A	0.11	36.15724	-119.5991	Upper Kaweah	CP 2/3
1205OW01	Lacustrine	0.04	660.87	N/A	0.00	35.63744	-119.3485	Upper Poso	CP 4 @ 7th Standard
1205OW03	Lacustrine	0.22	3531.54	N/A	0.00	36.28445	-119.5923	Tulare-Buena Vista Lakes	CP 2/3
1205OW04	Lacustrine	0.45	7288.49	N/A	0.00	36.21731	-119.6094	Tulare-Buena Vista Lakes	CP 2/3
1205OW15	Lacustrine	0.06	890.32	N/A	0.00	35.55771	-119.3295	Upper Poso	CP 4 @ 7th Standard
1205OW20	Canals/Ditches	0.01	183.09	N/A	0.00	35.94902	-119.4516	Upper Deer-Upper White	CP 2/3
1205OW21	Canals/Ditches	0.07	845.74	N/A	0.00	35.90572	-119.4478	Upper Deer-Upper White	CP 2/3
1205OW24	Lacustrine	0.00	0.00	N/A	0.10	35.76782	-119.3918	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL03	Vernal Pools and Swales	0.96	775.67	2.07986	0.00	35.73812	-119.3799	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL05	Vernal Pools and Swales	0.01	7.13	N/A	0.00	35.73739	-119.3794	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL06	Vernal Pools and Swales	0.01	5.78	N/A	0.00	35.73731	-119.3794	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL07	Vernal Pools and Swales	0.01	10.04	0.00337	0.00	35.73753	-119.3796	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL08	Vernal Pools and Swales	0.01	9.60	N/A	0.00	35.7372	-119.3793	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL10	Vernal Pools and Swales	0.26	213.54	0.17057	0.00	35.73924	-119.381	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL11	Vernal Pools and Swales	0.02	13.22	N/A	0.00	35.73863	-119.3802	Upper Deer-Upper White	CP 4 @ 7th Standard

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
1205WL13	Vernal Pools and Swales	0.14	115.80	N/A	0.00	35.74072	-119.382	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL14	Vernal Pools and Swales	0.14	116.17	0.06207	0.00	35.74037	-119.3815	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL15	Vernal Pools and Swales	0.20	161.51	0.27006	0.00	35.74039	-119.382	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL17	Vernal Pools and Swales	0.00	0.00	0.48210	0.00	35.74097	-119.381	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL20	Vernal Pools and Swales	2.55	2055.44	4.03078	0.00	35.74191	-119.3826	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL23	Vernal Pools and Swales	0.00	0.13	0.02868	0.00	35.74164	-119.3831	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL28	Vernal Pools and Swales	0.00	1.21	0.01553	0.00	35.74349	-119.3835	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL29	Vernal Pools and Swales	0.00	2.45	0.01390	0.00	35.74327	-119.3835	Upper Deer-Upper White	CP 4 @ 7th Standard
1205WL47	Seasonal wetland	0.00	6.55	N/A	0.00	36.66749	-119.7505	Upper Dry	CP1C
159FOW01	Canals/Ditches	0.00	0.00	N/A	0.01	36.32084	-119.5913	Tulare-Buena Vista Lakes	CP 2/3
162FOW01	Canals/Ditches	0.00	0.00	N/A	0.02	36.32008	-119.5915	Tulare-Buena Vista Lakes	CP 2/3
177PIOW01	Canals/Ditches	0.01	66.90	N/A	0.00	36.28756	-119.5911	Tulare-Buena Vista Lakes	CP 2/3
180BOW01	Canals/Ditches	0.04	526.80	N/A	0.01	36.27669	-119.5911	Tulare-Buena Vista Lakes	CP 2/3
180BOW02	Canals/Ditches	0.34	4375.22	N/A	0.12	36.30531	-119.592	Tulare-Buena Vista Lakes	CP 2/3
185BOW01	Canals/Ditches	2.25	29036.49	N/A	0.03	36.26931	-119.5917	Tulare-Buena Vista Lakes	CP 2/3
186BOW01	Canals/Ditches	0.01	159.47	N/A	0.01	36.26223	-119.5914	Tulare-Buena Vista Lakes	CP 2/3
190BOW02	Canals/Ditches	1.56	20150.99	N/A	0.16	36.25476	-119.5909	Tulare-Buena Vista Lakes	CP 2/3
198BOW02	Canals/Ditches	0.24	3140.55	N/A	0.00	36.24031	-119.5986	Tulare-Buena Vista Lakes	CP 2/3
240HOW03	Canals/Ditches	0.86	11145.04	N/A	0.39	36.13469	-119.5743	Upper Kaweah	CP 2/3
256GOW02	Canals/Ditches	0.23	2926.47	N/A	0.06	36.1109	-119.5504	Upper Kaweah	CP 2/3
272PISW01	Lacustrine	0.07	1076.09	N/A	0.00	36.08683	-119.5397	Upper Kaweah	CP 2/3
286BOW01	Lacustrine	0.00	23.52	N/A	0.12	36.0503	-119.5209	Upper Tule	CP 2/3
286JWL01	Seasonal wetland	0.01	23.16	N/A	0.28	36.04832	-119.5201	Upper Tule	CP 2/3
288BOW02	Canals/Ditches	0.37	4716.20	N/A	0.58	36.04678	-119.5194	Upper Tule	CP 2/3
288BOW03	Lacustrine	0.00	1.66	N/A	0.00	36.04323	-119.5176	Upper Tule	CP 2/3
288BOW05	Seasonal riverine	0.02	69.61	N/A	0.17	36.04264	-119.5163	Upper Tule	CP 2/3
288DWL02	Seasonal wetland	0.01	19.25	N/A	0.00	36.04777	-119.52	Upper Tule	CP 2/3
288DWL03	Seasonal wetland	0.00	0.00	N/A	0.42	36.04618	-119.5189	Upper Tule	CP 2/3
289DOW01	Canals/Ditches	0.00	32.72	N/A	0.00	36.0399	-119.5144	Tulare-Buena Vista Lakes	CP 2/3
289DOW02	Canals/Ditches	0.00	0.00	N/A	0.01	36.04002	-119.5141	Tulare-Buena Vista Lakes	CP 2/3
289DOW03	Canals/Ditches	0.00	0.00	N/A	0.02	36.04009	-119.5138	Tulare-Buena Vista Lakes	CP 2/3
289DWL01	Seasonal wetland	0.02	36.93	N/A	0.00	36.03993	-119.5143	Tulare-Buena Vista Lakes	CP 2/3
289DWL02	Seasonal wetland	0.00	0.00	N/A	0.02	36.04001	-119.5142	Tulare-Buena Vista Lakes	CP 2/3
289DWL03	Seasonal wetland	0.00	0.00	N/A	0.04	36.03781	-119.5128	Tulare-Buena Vista Lakes	CP 2/3
289DWL04	Seasonal wetland	0.00	0.00	N/A	0.01	36.04006	-119.5138	Tulare-Buena Vista Lakes	CP 2/3
290GOW01	Canals/Ditches	0.31	3942.70	N/A	0.07	36.03813	-119.5132	Tulare-Buena Vista Lakes	CP 2/3
290GOW02	Canals/Ditches	2.60	33566.11	N/A	0.92	36.02624	-119.5045	Tulare-Buena Vista Lakes	CP 2/3
297GOW01	Canals/Ditches	0.39	5083.72	N/A	0.05	36.02174	-119.5053	Tulare-Buena Vista Lakes	CP 2/3

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
297JWL01	Seasonal wetland	0.24	388.04	N/A	0.00	36.02025	-119.4996	Tulare-Buena Vista Lakes	CP 2/3
301GOW01	Canals/Ditches	0.32	4125.34	N/A	0.05	36.00738	-119.4955	Tulare-Buena Vista Lakes	CP 2/3
301GOW02	Canals/Ditches	0.34	4402.59	N/A	0.04	36.00822	-119.4917	Tulare-Buena Vista Lakes	CP 2/3
301GOW03	Canals/Ditches	0.22	2853.99	N/A	0.00	36.00992	-119.4914	Tulare-Buena Vista Lakes	CP 2/3
301RSWL92	Seasonal wetland	0.03	51.27	N/A	0.00	36.00988	-119.492	Tulare-Buena Vista Lakes	CP 2/3
301RSWL93	Seasonal wetland	0.02	29.03	N/A	0.00	36.00951	-119.4919	Tulare-Buena Vista Lakes	CP 2/3
301RSWL94	Seasonal wetland	0.01	15.26	N/A	0.00	36.00908	-119.4914	Tulare-Buena Vista Lakes	CP 2/3
301RSWL95	Seasonal wetland	0.00	8.01	N/A	0.00	36.00887	-119.4913	Tulare-Buena Vista Lakes	CP 2/3
301RSWL96	Seasonal wetland	0.00	1.10	N/A	0.00	36.00886	-119.4914	Tulare-Buena Vista Lakes	CP 2/3
306GOW02	Canals/Ditches	0.01	123.52	N/A	0.00	35.99264	-119.4853	Tulare-Buena Vista Lakes	CP 2/3
306GOW03	Canals/Ditches	0.61	7905.00	N/A	0.04	35.99455	-119.4826	Tulare-Buena Vista Lakes	CP 2/3
306GOW04	Canals/Ditches	0.00	0.00	N/A	0.05	35.99641	-119.48	Tulare-Buena Vista Lakes	CP 2/3
306RSWL88	Seasonal wetland	0.00	0.00	N/A	0.02	35.99635	-119.4821	Tulare-Buena Vista Lakes	CP 2/3
306RSWL89	Seasonal wetland	0.00	0.00	N/A	0.01	35.9962	-119.482	Tulare-Buena Vista Lakes	CP 2/3
306RSWL90	Seasonal wetland	0.00	0.00	N/A	0.02	35.99589	-119.4817	Tulare-Buena Vista Lakes	CP 2/3
306RSWL92	Seasonal wetland	0.00	3.34	N/A	0.00	35.99541	-119.4814	Tulare-Buena Vista Lakes	CP 2/3
306RSWL93	Seasonal wetland	0.04	72.06	N/A	0.00	35.99524	-119.4814	Tulare-Buena Vista Lakes	CP 2/3
306RSWL94	Seasonal wetland	0.01	9.08	N/A	0.00	35.99531	-119.4813	Tulare-Buena Vista Lakes	CP 2/3
306RSWL95	Seasonal wetland	0.01	9.78	N/A	0.00	35.99522	-119.4813	Tulare-Buena Vista Lakes	CP 2/3
306RSWL96	Seasonal wetland	0.02	32.86	N/A	0.00	35.99502	-119.4812	Tulare-Buena Vista Lakes	CP 2/3
306RSWL97	Seasonal wetland	0.01	12.11	N/A	0.00	35.99489	-119.4811	Tulare-Buena Vista Lakes	CP 2/3
306RSWL98	Seasonal wetland	0.03	42.22	N/A	0.00	35.99471	-119.481	Tulare-Buena Vista Lakes	CP 2/3
306RSWL99	Seasonal wetland	0.03	43.51	N/A	0.00	35.99446	-119.4808	Tulare-Buena Vista Lakes	CP 2/3
307GOW01	Lacustrine	0.93	14994.58	N/A	0.00	35.99167	-119.4793	Tulare-Buena Vista Lakes	CP 2/3
309DOW01	Canals/Ditches	0.95	12214.96	N/A	0.00	35.97984	-119.4707	Tulare-Buena Vista Lakes	CP 2/3
309GOW01	Canals/Ditches	1.16	14947.46	N/A	0.00	35.98706	-119.4761	Tulare-Buena Vista Lakes	CP 2/3
315DWL01	Seasonal wetland	0.32	509.44	N/A	0.00	35.97157	-119.4648	Tulare-Buena Vista Lakes	CP 2/3
315GOW01	Canals/Ditches	1.93	24873.44	N/A	1.34	35.97032	-119.4654	Tulare-Buena Vista Lakes	CP 2/3
315KWL01	Seasonal wetland	0.00	0.00	N/A	0.01	35.96838	-119.4618	Tulare-Buena Vista Lakes	CP 2/3
317EOW03	Canals/Ditches	0.52	6686.22	N/A	0.00	35.9722	-119.4659	Tulare-Buena Vista Lakes	CP 2/3
318DOW01	Canals/Ditches	0.10	1332.32	N/A	0.00	35.96236	-119.4582	Tulare-Buena Vista Lakes	CP 2/3
318DOW02	Canals/Ditches	0.00	56.21	N/A	0.00	35.96075	-119.4566	Tulare-Buena Vista Lakes	CP 2/3
318DWL01	Seasonal wetland	0.14	220.08	N/A	0.00	35.96094	-119.4569	Tulare-Buena Vista Lakes	CP 2/3
318KWL01	Seasonal wetland	0.18	298.25	N/A	0.22	35.9613	-119.4566	Tulare-Buena Vista Lakes	CP 2/3
322EOW01	Canals/Ditches	11.77	151939.99	N/A	0.01	35.95835	-119.4551	Tulare-Buena Vista Lakes	CP 2/3
325EOW01	Lacustrine	0.01	204.59	N/A	0.00	35.9495	-119.4472	Upper Deer-Upper White	CP 2/3
325KWL01	Seasonal wetland	0.02	34.09	N/A	0.01	35.94833	-119.4471	Upper Deer-Upper White	CP 2/3
330EOW02	Canals/Ditches	1.60	20666.41	N/A	0.05	35.92674	-119.4318	Upper Deer-Upper White	CP 2/3

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
336PIOW01	Lacustrine	0.90	14514.50	N/A	1.93	35.91622	-119.4264	Upper Deer-Upper White	CP 2/3
337EOW01	Seasonal riverine	0.00	5.81	N/A	0.06	35.92028	-119.4287	Upper Deer-Upper White	CP 2/3
349FOW01	Lacustrine	19.83	320003.52	N/A	0.30	35.89413	-119.4172	Upper Deer-Upper White	CP 2/3
349FOW02	Canals/Ditches	0.35	4507.68	N/A	0.00	35.8914	-119.4172	Upper Deer-Upper White	CP 2/3
349FOW03	Canals/Ditches	0.11	1451.74	N/A	0.00	35.89118	-119.4173	Upper Deer-Upper White	CP 2/3
349FOW04	Canals/Ditches	2.09	26917.40	N/A	0.04	35.89149	-119.4172	Upper Deer-Upper White	CP 2/3
385FOW01	Canals/Ditches	0.03	380.37	N/A	0.02	35.84051	-119.4094	Upper Deer-Upper White	CP 2/3
412OW02	Canals/Ditches	0.13	1716.02	N/A	0.00	36.08696	-119.5381	Upper Kaweah	CP 2/3
412OW03	Lacustrine	0.00	0.00	N/A	0.03	35.9123	-119.4383	Upper Deer-Upper White	CP 2/3
412OW04	Canals/Ditches	0.27	3452.78	N/A	0.16	35.91262	-119.4379	Upper Deer-Upper White	CP 2/3
412OW07	Canals/Ditches	3.79	48891.91	N/A	0.00	35.91282	-119.439	Upper Deer-Upper White	CP 2/3
412OW12	Canals/Ditches	0.07	911.64	N/A	0.01	35.91272	-119.4472	Upper Deer-Upper White	CP 2/3
478AOW01	Seasonal riverine	0.00	5.81	N/A	0.02	35.66468	-119.3336	Upper Poso	CP 4 @ 7th Standard
490AOW01	Canals/Ditches	0.50	6457.82	N/A	0.04	35.63765	-119.3375	Upper Poso	CP 4 @ 7th Standard
490ASW01	Lacustrine	0.17	2706.40	N/A	0.00	35.6372	-119.3394	Upper Poso	CP 4 @ 7th Standard
491AOW01	Canals/Ditches	0.00	0.00	N/A	0.03	35.63759	-119.3308	Upper Poso	CP 4 @ 7th Standard
498ASW02	Lacustrine	0.19	3036.78	N/A	0.00	35.61268	-119.334	Upper Poso	CP 4 @ 7th Standard
512PIOW01	Lacustrine	0.00	0.00	N/A	0.87	35.58644	-119.3219	Upper Poso	CP 4 @ 7th Standard
513OW08	Lacustrine	0.00	62.86	N/A	0.00	36.09431	-119.5364	Upper Kaweah	CP 2/3
513OW10	Lacustrine	0.00	6.58	N/A	0.00	35.60951	-119.3352	Upper Poso	CP 4 @ 7th Standard
513OW13	Canals/Ditches	0.09	1201.97	N/A	0.02	36.18907	-119.6108	Tulare-Buena Vista Lakes	CP 2/3
565AOW01	Lacustrine	0.05	752.91	N/A	0.00	35.52932	-119.3047	Upper Poso	CP 4 @ 7th Standard
576PIOW01	Lacustrine	0.09	1465.13	N/A	0.00	35.52188	-119.2962	Upper Poso	CP 4 @ 7th Standard
591PIOW01	Lacustrine	0.05	806.51	N/A	0.00	35.51065	-119.2827	Upper Poso	CP 4 @ 7th Standard
612PIOW01	Lacustrine	0.00	17.71	N/A	0.08	35.49432	-119.2624	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
620OW01	Canals/Ditches	0.15	1993.03	N/A	0.05	36.12349	-119.5705	Upper Kaweah	CP 2/3
622BOW02	Lacustrine	1.31	21096.11	N/A	0.10	35.4834	-119.2508	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
639PIOW01	Lacustrine	0.00	0.00	N/A	0.56	35.46658	-119.2163	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
659BOW03	Canals/Ditches	0.07	855.00	N/A	0.01	35.4422	-119.1997	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
AB003AWL01	Seasonal wetland	0.03	40.84	N/A	0.00	35.9353	-119.4379	Upper Deer-Upper White	CP 2/3
AB006AWL01	Seasonal wetland	0.39	623.83	N/A	0.03	35.92084	-119.4289	Upper Deer-Upper White	CP 2/3
AB016AWL01	Vernal Pools and Swales	0.03	20.46	1.30530	0.00	35.86799	-119.4119	Upper Deer-Upper White	CP 2/3
AB016AWL03	Vernal Pools and Swales	0.05	40.71	0.00790	0.00	35.86922	-119.4126	Upper Deer-Upper White	CP 2/3
AB017AWL01	Vernal Pools and Swales	0.07	52.65	0.07256	0.00	35.86601	-119.4122	Upper Deer-Upper White	CP 2/3
AB017AWL07	Vernal Pools and Swales	0.11	87.20	0.03660	0.00	35.86078	-119.412	Upper Deer-Upper White	CP 2/3
AB017AWL08	Vernal Pools and Swales	0.02	16.90	0.09074	0.00	35.86041	-119.4121	Upper Deer-Upper White	CP 2/3
AB018AWL01	Vernal Pools and Swales	0.04	31.48	N/A	0.00	35.85865	-119.4116	Upper Deer-Upper White	CP 2/3
AB018BWL01	Canals/Ditches	2.43	31341.65	N/A	0.13	35.85193	-119.4111	Upper Deer-Upper White	CP 2/3

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
AB018BWL02	Vernal Pools and Swales	0.68	545.18	1.74100	0.00	35.8594	-119.411	Upper Deer-Upper White	CP 2/3
AB019BOW01	Lacustrine	0.03	550.36	N/A	0.00	35.84795	-119.4107	Upper Deer-Upper White	CP 2/3
AB037PIOW01	Canals/Ditches	0.45	5866.79	N/A	0.31	35.74313	-119.3839	Upper Deer-Upper White	CP 4 @ 7th Standard
AB040BOW01	Canals/Ditches	0.00	0.00	N/A	0.46	35.73225	-119.3766	Upper Deer-Upper White	CP 4 @ 7th Standard
AB040PIOW01	Lacustrine	0.68	10894.53	N/A	0.00	35.73304	-119.3753	Upper Deer-Upper White	CP 4 @ 7th Standard
AB044BOW01	Lacustrine	0.15	2430.62	N/A	0.00	35.7175	-119.3655	Upper Deer-Upper White	CP 4 @ 7th Standard
AB044BOW02	Lacustrine	0.00	0.11	N/A	0.00	35.71815	-119.3663	Upper Deer-Upper White	CP 4 @ 7th Standard
AB056BOW01	Canals/Ditches	0.12	1612.91	N/A	0.07	35.67429	-119.3364	Upper Deer-Upper White	CP 4 @ 7th Standard
ACE08OW	Canals/Ditches	0.00	0.00	N/A	0.02	35.52884	-119.3055	Upper Poso	CP 4 @ 7th Standard
ACE09OW	Canals/Ditches	0.00	0.00	N/A	0.02	35.52929	-119.3061	Upper Poso	CP 4 @ 7th Standard
ACE12OW	Lacustrine	0.15	2464.27	N/A	0.00	36.03176	-119.5094	Tulare-Buena Vista Lakes	CP 2/3
ACE13OW	Lacustrine	1.20	19311.57	N/A	0.00	36.03193	-119.5089	Tulare-Buena Vista Lakes	CP 2/3
ACE16OW	Lacustrine	5.30	85478.90	N/A	0.00	36.02982	-119.5075	Tulare-Buena Vista Lakes	CP 2/3
BN153WL01	Vernal Pools and Swales	0.20	161.54	0.97043	0.00	35.74421	-119.3834	Upper Deer-Upper White	CP 4 @ 7th Standard
BN153WL02	Vernal Pools and Swales	0.10	78.69	0.15475	0.00	35.74308	-119.3835	Upper Deer-Upper White	CP 4 @ 7th Standard
BN162OW01	Lacustrine	0.36	5868.18	N/A	0.64	35.65408	-119.3318	Upper Poso	CP 4 @ 7th Standard
BN20OW01	Canals/Ditches	0.04	452.26	N/A	0.00	36.55001	-119.7328	Upper Dry	CP 2/3
CCE100OW	Canals/Ditches	2.80	36109.76	N/A	0.65	36.11342	-119.5578	Upper Kaweah	CP 2/3
CCE103OW	Lacustrine	0.22	3506.37	N/A	0.00	36.10924	-119.5524	Upper Kaweah	CP 2/3
CCE105OW	Canals/Ditches	0.13	1661.85	N/A	0.12	36.10886	-119.5566	Upper Kaweah	CP 2/3
CCE107OW	Canals/Ditches	0.01	183.00	N/A	0.00	36.10845	-119.5594	Upper Kaweah	CP 2/3
CCE110OW	Canals/Ditches	0.17	2192.35	N/A	0.27	36.1083	-119.5542	Upper Kaweah	CP 2/3
CCE113OW	Canals/Ditches	0.13	1631.65	N/A	0.07	36.07988	-119.5326	Upper Kaweah	CP 2/3
CCE119OW	Canals/Ditches	0.20	2574.49	N/A	0.00	36.06533	-119.5275	Upper Kaweah	CP 2/3
CCE130OW	Lacustrine	0.00	31.78	N/A	0.00	35.70296	-119.357	Upper Deer-Upper White	CP 4 @ 7th Standard
CCE133OW	Lacustrine	0.10	1580.71	N/A	0.00	35.56449	-119.3314	Upper Poso	CP 4 @ 7th Standard
CCE147OW	Lacustrine	0.00	0.00	N/A	0.32	35.49752	-119.2645	Tulare-Buena Vista Lakes	CP 4 @ 7th Standard
CCE19OW	Canals/Ditches	0.13	1699.20	N/A	0.00	36.56136	-119.7351	Upper Dry	CP 2/3
CCE204OW	Canals/Ditches	1.17	15149.02	N/A	0.00	36.24021	-119.6005	Tulare-Buena Vista Lakes	CP 2/3
CCE20OW	Canals/Ditches	0.31	4032.30	N/A	0.21	36.46117	-119.6405	Upper Dry	CP 2/3
CCE218OW	Canals/Ditches	0.04	473.58	N/A	0.03	36.20729	-119.6114	Tulare-Buena Vista Lakes	CP 2/3
CCE219OW	Canals/Ditches	0.33	4215.47	N/A	0.00	36.21113	-119.6041	Tulare-Buena Vista Lakes	CP 2/3
CCE21OW	Canals/Ditches	0.15	1875.85	N/A	0.15	36.45918	-119.6405	Upper Dry	CP 2/3
CCE220OW	Canals/Ditches	0.01	122.21	N/A	0.00	36.67249	-119.751	Upper Dry	CP1C
CCE22OW	Seasonal riverine	0.00	0.00	N/A	0.03	36.45415	-119.6296	Tulare-Buena Vista Lakes	CP 2/3
CCE241WL	Vernal Pools and Swales	0.03	20.67	N/A	0.00	35.96289	-119.4585	Tulare-Buena Vista Lakes	CP 2/3
CCE28OW	Seasonal riverine	0.00	0.00	N/A	0.08	36.4466	-119.6229	Tulare-Buena Vista Lakes	CP 2/3
CCE2OW	Canals/Ditches	0.04	475.37	N/A	0.02	36.69558	-119.7573	Upper Dry	CP1C

Waters Name	Type	Direct Permanent		Indirect Bisect	Direct Temporary	Latitude	Longitude	Watershed	Construction Package
		Acreage	Volume of Fill (cy)	Acreage	Acreage				
CCE30OW	Seasonal riverine	0.00	11.62	N/A	0.11	36.43109	-119.6117	Tulare-Buena Vista Lakes	CP 2/3
CCE32OW	Canals/Ditches	0.00	0.00	N/A	0.01	36.42989	-119.61	Tulare-Buena Vista Lakes	CP 2/3
CCE34OW	Canals/Ditches	0.61	7826.81	N/A	0.18	36.40388	-119.5956	Tulare-Buena Vista Lakes	CP 2/3
CCE36OW	Canals/Ditches	0.96	12356.17	N/A	0.04	36.37199	-119.5867	Tulare-Buena Vista Lakes	CP 2/3
CCE37OW	Canals/Ditches	0.62	7964.16	N/A	0.13	36.36763	-119.5918	Tulare-Buena Vista Lakes	CP 2/3
CCE38OW	Lacustrine	0.13	2025.62	N/A	0.00	36.36292	-119.5916	Tulare-Buena Vista Lakes	CP 2/3
CCE39OW	Lacustrine	0.16	2649.29	N/A	0.00	36.36277	-119.5916	Tulare-Buena Vista Lakes	CP 2/3
CCE40OW	Lacustrine	0.36	5736.24	N/A	0.00	36.36233	-119.5915	Tulare-Buena Vista Lakes	CP 2/3
CCE41OW	Lacustrine	0.24	3811.60	N/A	0.00	36.36231	-119.5918	Tulare-Buena Vista Lakes	CP 2/3
CCE50OW	Canals/Ditches	0.20	2632.03	N/A	0.00	36.26954	-119.5957	Tulare-Buena Vista Lakes	CP 2/3
CCE53OW	Canals/Ditches	0.02	223.54	N/A	0.01	36.24018	-119.6054	Tulare-Buena Vista Lakes	CP 2/3
CCE54OW	Lacustrine	0.08	1290.67	N/A	0.00	36.21603	-119.609	Tulare-Buena Vista Lakes	CP 2/3
CCE55OW	Seasonal riverine	0.24	785.82	N/A	0.00	36.2116	-119.6199	Tulare-Buena Vista Lakes	CP 2/3
CCE58OW	Seasonal riverine	0.18	572.01	N/A	0.00	36.21056	-119.6202	Tulare-Buena Vista Lakes	CP 2/3
CCE59OW	Canals/Ditches	0.23	2977.59	N/A	0.01	36.21084	-119.6096	Tulare-Buena Vista Lakes	CP 2/3
CCE60SW	Emergent wetland	0.01	20.41	N/A	0.00	36.20248	-119.613	Tulare-Buena Vista Lakes	CP 2/3
CCE61OW	Seasonal riverine	1.63	5271.69	N/A	0.00	36.20231	-119.6142	Tulare-Buena Vista Lakes	CP 2/3
CCE65OW	Canals/Ditches	0.06	819.79	N/A	0.02	36.19637	-119.6133	Tulare-Buena Vista Lakes	CP 2/3
CCE68OW	Canals/Ditches	0.05	633.34	N/A	0.00	36.19634	-119.6107	Tulare-Buena Vista Lakes	CP 2/3
CCE69OW	Canals/Ditches	0.11	1411.59	N/A	0.05	36.18199	-119.6097	Tulare-Buena Vista Lakes	CP 2/3
CCE73OW	Canals/Ditches	0.00	0.00	N/A	0.02	36.18917	-119.6123	Tulare-Buena Vista Lakes	CP 2/3
CCE78OW	Canals/Ditches	0.13	1707.55	N/A	0.06	36.18179	-119.6098	Tulare-Buena Vista Lakes	CP 2/3
CCE79OW	Seasonal riverine	0.00	0.00	N/A	0.02	36.17292	-119.6079	Upper Kaweah	CP 2/3
CCE86OW	Canals/Ditches	0.40	5184.85	N/A	0.06	36.15952	-119.601	Upper Kaweah	CP 2/3
CCE87OW	Canals/Ditches	0.58	7427.76	N/A	0.09	36.14971	-119.5922	Upper Kaweah	CP 2/3
CCE89OW	Canals/Ditches	0.53	6791.84	N/A	0.21	36.13913	-119.5848	Upper Kaweah	CP 2/3
CCE94OW	Canals/Ditches	0.32	4128.11	N/A	0.16	36.13776	-119.5875	Upper Kaweah	CP 2/3
CCE98OW	Canals/Ditches	0.08	986.70	N/A	0.02	36.13667	-119.5852	Upper Kaweah	CP 2/3
KM006BOW01	Lacustrine	0.00	0.00	N/A	0.02	35.56895	-119.3315	Upper Poso	CP 4 @ 7th Standard
KM006BOW02	Lacustrine	0.00	0.00	N/A	0.12	35.57272	-119.3315	Upper Poso	CP 4 @ 7th Standard
KM006BOW03	Lacustrine	0.00	0.00	N/A	0.24	35.57197	-119.3315	Upper Poso	CP 4 @ 7th Standard
KM006PIOW01	Lacustrine	0.00	0.00	N/A	0.19	35.57219	-119.3327	Upper Poso	CP 4 @ 7th Standard
KM008BOW02	Lacustrine	0.31	5036.60	N/A	0.00	35.55585	-119.3286	Upper Poso	CP 4 @ 7th Standard
PI04OW	Canals/Ditches	0.03	331.56	N/A	0.01	36.06073	-119.5258	Upper Kaweah	CP 2/3
PI06WL	Lacustrine	0.31	5033.50	N/A	9.12	36.15638	-119.5971	Upper Kaweah	CP 2/3
WH140OW01	Canals/Ditches	0.06	802.42	N/A	0.02	35.86966	-119.4129	Upper Deer-Upper White	CP 2/3

Appendix 6:
Best Management Practices

1.0 Pre- and Post-Construction Best Management Practices

A number of actions and measures have been and/or are proposed to be implemented as part of the project to avoid and minimize effects to water features, wetlands, other waters and associated biological resources. Avoidance and minimization measures include those which have been or are proposed to be implemented as part of the design process, prior to site preparation, and/or during construction. Approaches and measures to avoid and minimize impacts on biological resources, including those associated with water features, wetlands and other waters, were incorporated into the alignment selection during the preliminary design stages. Additional avoidance measures are described in Sections 3 and 5 of the Checkpoint C Summary Report (Authority and FRA 2013a). Further refinements and procedures that may be identified during final design and construction may further avoid and minimize impacts on natural resources.

1.1 Avoidance and Minimization

The design standards for tracks that can accommodate an HST traveling at 220 mph (design speed) allow little flexibility to create curves that avoid certain resources (the curve radius is a minimum of approximately 5 miles). However, during preparation of the EIR/EIS and development of Checkpoint C Summary Report considerations were given to design alternatives that would avoid and minimize impacts on the aquatic environment. As discussed in Sections 3 and 5 of the Checkpoint C Summary Report (Authority and FRA 2013a), while significant effort has been made to produce a preliminary design that avoids and/or limits impacts on water features, wetlands, and other waters, the actual configuration of the various crossings will not be known until a D/B team is determined and has prepared its first design submittal. Avoidance and minimization measures developed through the environmental review process and in coordination with regulatory agencies (e.g., USACE, EPA) are discussed below. The Authority and FRA will coordinate with resource agencies to provide cross-sectional and profile data of the proposed crossings as further refinement of the planning and design process as appropriate.

1.1.1 Avoidance Measures

As identified in Sections 3 and 5 of the Checkpoint C Summary Report (Authority and FRA 2013a), the Authority and FRA established a project objective to route tracks adjacent to existing transportation corridors to the extent practicable to minimize community disruption and environmental impacts pursuant to Streets & Highways Code Section 2407.09(g). While this objective cannot always be met, in general the introduction of new greenfield alternatives has been avoided. Staying near existing transportation corridors consolidates transportation facilities and associated effects such as noise and visual effects from transportation infrastructure. Additionally, the Authority has considered a range of alternatives so that the various impacts can be compared and balanced to identify the Preferred Alternative.

1.1.2 Minimization Measures

Where impacts on water features, wetlands, and other waters could not be avoided, temporary and permanent impacts on aquatic resources will be minimized to the extent feasible, while meeting the primary need to construct and operate the HST safely. To minimize permanent impacts on water features, wetlands, and other waters, spans will be designed to minimize the number of support piers and bents. Other BMPs will be implemented to minimize sedimentation and in-water impacts on water quality during construction, as described below. Additional measures will also be identified in the project Storm Water Pollution Prevention Plan (SWPPP) and post-construction water quality management plan to be prepared by the D/B contractor in

accordance with the Construction General Permit[1] standards and requirements and the Caltrans Permit standards and requirements, respectively.

1.2 Construction and Post-Construction BMPs

The Mitigation Monitoring and Reporting Program (MMRP) (Authority and FRA 2013b) will form the framework and responsibilities to be assigned to the D/B contractor, construction manager, and the Authority. The mitigation responsibilities will be represented in the D/B contract bid documents. The pre-construction surveys itemized in these documents, such as for plant and wildlife, will provide the basis for establishing Environmentally Sensitive Areas (ESAs), Environmentally Restricted Areas (ERAs), and exclusion fencing to minimize or avoid biological impacts, including impacts on water features, wetlands, and other waters. The contractor will be responsible for establishing the ESAs and ERAs under the supervision of the Project Biologist and consistent with the permits and design. By incorporating provisions such as these, the avoidance and minimization measures will be identified, assigned, monitored, and reported on. A number of BMPs will be implemented during the construction and post-construction phases of the HST project (for example, avoidance periods associated with sensitive biological resources life stages would be incorporated as part of the overall project schedule).

These BMPs may also be considered for inclusion in the project SWPPP, in the USFWS Biological Resources Management Plan, and in post-development water quality technical reports. The BMPs identified below are not comprehensive or final, but are examples of BMPs that can be used to comply with the standards of the Construction General Permit and the Caltrans permit. These BMPs are subject to change, including the addition of BMPs and/or the replacement of BMPs, when the D/B contractor prepares the project SWPPP and the post-development water quality management plan. The strategy used for implementing construction site BMPs depends, in part, on project site conditions and anticipated construction operations. While the recommendations below are suitable for construction operations for the HST project, the construction contractor will ultimately be responsible for compliance with the Construction General Permit. Therefore, the construction contractor will have the responsibility and discretion to implement whatever combination of BMPs is needed to meet Construction General Permit requirements.

The Authority is also presently obtaining post-development coverage under CWA Section 402 for HST facilities. This process is expected to take substantial time, including completion of internal review by the Authority and the SWRCB. Section 402 NDPES permit coverage authorizing discharges during project operations must be in place at the time that the first Notice of Termination is filed under the Construction General Permit. It is currently anticipated that a statewide Section 402 General NPDES Permit for post-development discharges of stormwater will ultimately be issued for the California HST System with terms and conditions substantially similar to those set forth in the Section 401 permit.

Source information for the construction phase and post-construction phase BMPs listed below include:

- USFWS BO (USFWS 2013).
- Fresno to Bakersfield EIR/EIS (Biological Resources, Geology Soils and Seismicity, Hydrology Water Resources sections (Authority and FRA 2014); mitigation measures identified by "MM" nomenclature below.
- Caltrans Construction Site BMPs Manual (Caltrans 2003a).
- MMRP (Authority and FRA 2013b).

[1] SWRCB NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities for Construction Activities (SWRCB 2009, as amended).

1.2.1 Construction Phase Best Management Practices

Construction-phase BMPs will be implemented to minimize construction-related water quality impacts, pursuant to the standards and requirements of the Construction General Permit, and will provide an effective combination of erosion and sediment controls. The selection of BMPs will depend on site characteristics and anticipated weather conditions at the project site. Implementation of these BMPs will be based on site-specific requirements as determined by the Qualified SWPPP Developer and/or Qualified SWPPP Practitioner. The Construction SWPPP will include measures to address erosion and sediment control BMPs, source control BMPs, non-stormwater management, and post-construction BMPs. BMPs to be implemented, as appropriate, are summarized below. Guidance for deployment and maintenance of these construction site BMPs is presented in applicable California Stormwater BMP fact sheets. In addition, requirements for construction BMPs to minimize or avoid impacts on biological resources are contained in the EIR/EIS.

1.2.1.1 General

The Authority will avoid or minimize potential construction-related water quality impacts through compliance with the Construction General Permit. The Authority will be responsible for filing a Notice of Intent with the SWRCB and the contractor will prepare a SWPPP, developed by a qualified SWPPP practitioner, and implement an appropriate suite of temporary construction BMPs.

1.2.1.2 Biological Resources

Where impacts could not be avoided through design measures, the following measures have been identified to minimize impacts on wildlife functions associated with water features, wetlands, and other waters (the source of each measure is identified in parentheses):

1. Construction equipment will be washed before entering and leaving the work area (USFWS BO Conservation Measure #16).
2. Prior to ground-disturbing activities, the contractor will locate staging areas for construction equipment outside sensitive biological resources, including habitat for special-status species, habitats of concern (e.g. water features, wetlands, and other waters, including non-wetland riparian communities), and wildlife movement corridors, to the maximum extent possible. The contractor will submit a memorandum to the Authority documenting compliance (Bio-MM #9).
3. As much as is practicable, construction staging will use the same areas that will ultimately be occupied by permanent HST facilities (USFWS BO Conservation Measure #14).
4. Fencing will be placed to establish non-disturbance exclusion zones to restrict construction equipment and personnel from entering environmentally sensitive areas or restrict wildlife species from entering construction areas (USFWS BO Conservation Measure #10).
5. ESAs and ERAs will be delineated on plans and in the field.
    a. Prior to ground-disturbing activities, to the extent practicable, the contractor will verify that ESAs and ERAs are delineated as appropriate. ESAs are areas within the construction zones containing suitable habitat for special-status species and habitats of concern that may allow construction activities, but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are areas outside the construction footprint that must be protected in-place during all construction activities.

b. Prior to ground-disturbing activities, the contractor will include all ESAs and ERAs on final construction plans (including grading and landscape plans); prepare, review, and approve the map of all ESAs and ERAs on the design drawings; and work to update the map as necessary.

c. Prior to ground-disturbing activities, the contractor will mark ESAs and ERAs with high-visibility temporary fencing to prevent encroachment of construction personnel and equipment onto sensitive areas. Designate the two categories, ESA and ERA, differently in the field (e.g., different colored flagging/fencing). Use sub-meter accurate global positioning system equipment to delineate all ESAs and ERAs. Remove ESA and ERA fencing when construction is complete or the resource has been cleared according to agency permit conditions and construction drawings and specifications. The contractor will submit memoranda regarding the field delineation of all ESAs/ERAs to the Authority. These areas will receive ongoing monitoring during site preparation and construction activities (Bio-MM #7).

6. For seasonal avoidance of special-status vernal pool branchiopods and vernal pool-dependent species (e.g., California tiger salamander), work will not be conducted within 250 feet of aquatic habitats suitable for these species (e.g., vernal pools and other seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season. If any work remains to be completed after October 15, exclusion fencing and erosion control measures will be placed as a buffer between ground-disturbing activities and the vernal pools and other seasonal wetlands, as determined through consultations with the USFWS or USACE (Bio-MM #19).

7. During ground-disturbing activities, the contractor will conduct monitoring within water features, wetlands and other waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc., as specified by the SWPPP), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The contractor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures and as listed in the Section 401 certification, USFWS, CDFW, and USACE permits conditions. The contractor will report and document compliance consistent with requirements in the permitting documents, including frequency and timing and submittals (Bio-MM #49).

8. During construction, work window restrictions will be implemented during which certain activities such as initial site preparation will be phased to minimize effects on resources. For example, scheduling construction activities in consideration of the breeding season at or near a stream crossing that includes riparian vegetation with breeding bird habitat could avoid impacts on breeding species. These areas will be fenced as ESAs. Pre-construction surveys will be completed to determine the presence of species prior to site preparation to determine the need for avoidance or minimization of effects to the species. This is particularly relevant for breeding bird habitat and for California tiger salamander because considerable breeding habitat exists for these species. Construction would be phased, as described in the construction work window restriction item above, or timed to allow the surveys to proceed without the need for relocation (MMRP Bio-MM #19 and 29 and 30).

9. Areas that have native riparian or wetland vegetation may be restored in the temporary impact areas as dictated by site and project constraints where aligned with key riparian or wetland features. Prior to construction, cuttings, duff, and other genetic or biomass

materials may be salvaged to assist the re-establishment of the landscape (MMRP Bio-MM #15 and 44).

10. Project area vehicle speed limits will be integrated into the construction operation to minimize dust, erosion, noise, and startle effects during the site preparation and construction periods (Bio-MM #11 and MMRP Bio-MM#10).

11. Remnant parcel areas will be utilized, when available, as staging or laydown areas during construction, thus minimizing and avoiding impacts on more sensitive areas elsewhere. Pre-construction surveys will be carried out to determine that the remnant areas do not support sensitive resources and that the remnant areas could be excluded from use during construction (Bio-MM #9).

1.2.1.3 Erosion and Sediment Control Best Management Practices

1. Standard construction practices, including BMP naming conventions, such as those listed in Caltrans' Construction Site BMPs Manual (Caltrans 2003a) and Caltrans' Construction Site BMP Field Manual and Troubleshooting Guide (Caltrans 2003b), will be followed in order to reduce the potential for erosion.

2. Effective soil cover will be provided for inactive construction areas (i.e., areas of construction activities that have been disturbed and are not scheduled to be redisturbed for at least 14 days) (Bio-MM # 49).

3. Construction activities will be conducted to the extent possible during periods when rain is not predicted, in order to minimize the probability that disturbed soils will be exposed to rain. Disturbed soils will be stabilized as soon as practical after completion of construction (Caltrans SS-1, SS-3, SS-4, SS-5, SS-6, SS-7, and SS-8).

4. Existing vegetation will be left undisturbed as long as possible; construction scheduling will be employed to ensure land disturbance is conducted only when needed in the construction sequence. Vegetation that can be preserved will be identified and flagged or fenced to avoid disturbance (Caltrans SS-1, SS-2).

5. Where feasible, areas that may have substantial erosion risk will be avoided, including areas with erosive soils and steep slopes. Grading activities will be performed in such as manner as to not produce direct routes for conveying runoff to drainage channels (Bio-MM #49).

6. Measures will be implemented to reduce erosion of exposed soil; such measures may include soil stabilization, watering for dust control, installation of perimeter silt fences, placement of fiber rolls, and construction of sediment basins (Caltrans SC-1, SC-5).

7. Temporary concentrated flow management systems, such as berms, ditches, and outlet-flow-velocity-dissipation devices to reduce sediment transport from newly disturbed sites will be implemented (Checkpoint C Bio-MM#49).

8. Erosion control materials will not include plastic monofilament netting (erosion-control matting) or similar materials (USFWS BO Conservation Measure #11 and Bio-MM #10).

9. During ground-disturbing activities, the contractor will restrict project-related vehicle traffic, within the construction area, to established roads, construction areas, and other designated areas. Established vehicle traffic locations disturbed by previous activities would prevent further adverse effects. A 15 mph speed limit for construction areas would be observed within potential special-status species habitat. Access routes would be clearly flagged and marked and off-road traffic would be prohibited. The contractor will submit a memorandum

to the Authority documenting compliance on a weekly basis (Bio-MM #11, USFWS BO Conservation Measure #18).

10. Diversion drains or gravel bag berms will be installed, as appropriate, to intercept stormwater runoff and direct it around the construction work area (Caltrans SS-9).

11. Sediment controls, such as gravel bag berms, fiber rolls, or silt fence, will be placed at the base of soil stockpiles in order to prevent discharge of sediment-laden runoff. Stockpiles will be covered when rain is predicted, and dust control BMPs will be implemented to control wind erosion. Stockpiles will be sited away from drainages and storm drain inlets (Caltrans SS-7, WE-1, WM-3).

12. Storm drain inlets in proximity to construction activities will be protected by use of drop inlet filter fabrics, gravel bags, and/or fiber rolls. Inlet protections must not cause flooding of roadways (Caltrans SC-10).

13. Construction site entrances will be stabilized, inspected regularly, and any trackout promptly managed with street sweeping or vacuuming (Caltrans TC-1, SC-7).

14. In order to minimize dust production, a speed limit of 20 mph will be enforced in temporary and permanent construction areas (USFWS BO Conservation Measure #18).

15. Disturbed slopes and stream banks will be protected from wind and water erosion with tackifier or hydraulic mulch (Caltrans SS-3, SS-4, SS-5, SS-6, and SS-12).

16. Immediately following construction, disturbed soils will be stabilized, as appropriate. Revegetation will be conducted in accordance with the project's Restoration and Revegetation Plan (Caltrans SS-3, SS-4, SS-5, SS-6, SS-7, and SS-8).

1.2.1.4 Non-Stormwater Management and Source Controls

1. Construction materials, equipment, and maintenance supplies will be managed such that contact with stormwater is minimized. Materials storage will be sited near the construction entrance and away from drainages (Caltrans WM-1, WM-2).

2. Temporary storage of excavated materials produced by construction activities will be in designated areas at or near the construction site. Where possible, excavated soil will be returned to its original location to be used as backfill (USFWS BO Conservation Measure #15).

3. Construction waste materials will be disposed of in local landfills permitted to accept those types of materials. Material unsuitable for reuse will be hauled offsite to a permitted location (USFWS BO Conservation Measure #15).

4. A spill prevention and emergency response plan will be developed for potential fuel or other spills (Caltrans WM-4).

5. Storage, handling, transportation, and disposal of hazardous waste materials will comply with applicable federal, state, and local laws; and will be in accordance with the applicable BMP Fact Sheet (Caltrans WM-6).

6. Concrete wash water will be managed to ensure it is not discharged from the construction site. Measures will be implemented to capture and dispose of concrete wash water properly, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possibly treatment with dry ice or other acceptable means to

reduce the alkaline character of the runoff (high pH) that typically results from new concrete (Caltrans WM-8).

7. Trash and construction debris will be placed in appropriate waste collection containers, which will be emptied regularly. Good housekeeping practices will be observed (Caltrans WM-5).

8. Sanitary facilities will be sited at least 50 feet away from drainages, environmentally sensitive areas, and watercourses (Caltrans WM-9).

9. Construction groundwater may be encountered in excavations and require dewatering. Any discharge of construction dewater will be in accordance with applicable permits and applicable BMP Fact Sheet (Caltrans NS-2).

10. For construction in or near streams with flowing water, clear water diversions will be used, where appropriate, to control turbidity (Caltrans NS-5). Any diversion of water necessary for project implementation will require the contractor to prepare a water diversion plan that complies with all regulatory permits and agreements. Dewatering permits include Central Valley RWQCB, Order No. R5-2013-0074, Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters and SWRCB Water Quality Order No. 2003-003-DWQ, Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (USFWS BO Conservation Measure #17).

11. A biological monitor will be present prior to construction in streams with flowing water (BIO-MM#49).

12. Contractor will not conduct work within 250 feet of an avoided seasonal wetland or vernal pool from October 15 to June 1, unless exclusion fencing and erosion control measures are installed and monitoring is conducted (BIO-MM#19).

13. Where construction involves local road improvements, measures to control non-stormwater discharges associated with paving and grinding operations will be implemented (Caltrans NS-3).

14. If construction requires temporary stream crossings to accommodate construction equipment, measures will be implemented to prevent water quality impacts on the affected stream (Caltrans NS-4).

1.2.2 Post-Construction Phase Best Management Practices

Stormwater quality standards have been developed in consultation with the SWRCB and for implementation of post-construction stormwater quality design measures for the Fresno to Bakersfield Section PP1 which are expected to be incorporated into the Section 401 permit. This approach represents the consensus of a technical working group composed of the Authority, their regional consultants, and the SWRCB. The SWRCB has determined that implementation of post-construction treatment and hydromodification control BMPs, in compliance with the Caltrans permit post-construction standards and requirements, meets or exceeds compliance with the requirements of Section XIII of the Construction General Permit.

Implementation of permanent post-construction BMPs will minimize potential water quality impacts associated with runoff from HST facilities. The contractor will be responsible for constructing permanent post-construction stormwater BMPs in accordance with Authority standards. The post-construction BMPs and the SWPPP requirements will meet post-development hydromodification control standards to minimize adverse effects such as offsite erosion, sedimentation, and water quality impairments. The Authority will be responsible for long-term

inspection and maintenance of the permanent BMPs within its jurisdictional right-of-way to ensure that the BMPs are maintained in good working order.

Post-construction BMPs include the following:

1. Prioritized implementation of Low Impact Development Treatment BMPs such as infiltration basins and trenches, harvest and reuse BMPs, biofiltration swales and strips, media filters, and detention basins to minimize water quality impacts associated with the operation and maintenance of the HST System will protect water quality and channel stability in receiving waters.

2. Post-construction compliance reports will be prepared and submitted consistent with regulatory permits (BIO-MM#15; USFWS BO Conservation Measure #20).

3. The D/B contractor is also responsible for preparing a post-development water quality management plan.

Appendix 7:
Draft Compensatory Mitigation Plan

The Draft Compensatory Mitigation Plan is presented on the CD that accompanies this application.

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Appendix 7:

Draft Compensatory Mitigation Plan

CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report / Environmental Impact Statement

DRAFT

Fresno to Bakersfield

Compensatory Mitigation Plan

November 2013

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

California High-Speed Train Project

Compensatory Mitigation Plan

Prepared by:

URS/HMM/Arup Joint Venture

November 2013

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Acronyms

APN	assessor parcel number
ARRA	American Recovery and Reinvestment Act
Authority	California High-Speed Rail Authority
BNSF	BNSF Railway
California ESA	California Endangered Species Act
CAPP	Conceptual Area Protection Plan
CDFW	California Department of Fish and Wildlife
CEHC	California Essential Habitat Connectivity (Project)
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRAM	California Rapid Assessment Method
CVRWQCB	Central Valley Regional Water Quality Control Board
CWHR	California Wildlife Habitat Relationship System
CWMW	California Wetlands Monitoring Workgroup
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESRP	Endangered Species Recovery Program
federal ESA	federal Endangered Species Act of 1973
FR	Federal Register
FRA	Federal Railroad Administration
GIS	Geographic Information System
HCP	Habitat Conservation Plan
HMF	heavy maintenance facility

HMLA	Habitat Management Land Acquisition
HST	high-speed train
HUC	Hydrologic Unit Code
I-5	Interstate 5
LEDPA	Least Environmentally Damaging Practicable Alternative
NAIP	National Agriculture Imagery Program
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
PLFAF	Proposed Land for Acquisition Form
PTE	permission to enter
RC	regional consultant
ROD	Record of Decision
RTP	regional transportation plan
RWQCB	Regional Water Quality Control Board
SR	State Route
Statewide Program EIR/EIS	Final Program Environmental Impact Report and Environmental Impact Statement for Proposed California High Speed Train System
SWRCB	State Water Resources Control Board
TPSS	traction power supply station
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
waters of the U.S.	waters of the United States
WRAPP	Wetland and Riparian Area Protection Policy

Section 1.0
Introduction

1.0 Introduction

This section describes the objectives and organization of this Compensatory Mitigation Plan. Additionally, this section describes the proposed project, the project history, and the project's consultation history.

1.1 Draft Compensatory Mitigation Plan Objectives

The fundamental objective of this Draft Compensatory Mitigation Plan is to identify mitigation options to offset environmental losses resulting from unavoidable impacts on sensitive natural resources from the Fresno to Bakersfield Section of the California High-Speed Train (HST) System. This mitigation plan will be attached to the Checkpoint C document to support a preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) decision, and revised and tailored to satisfy specific permits in support of future permit submittals, with the goal of permit issuance by State and federal agencies.

In accordance with agency guidance, this mitigation plan has been prepared with the intent of maximizing available mitigation and conservation credits and opportunities for mitigation; providing for regional variations in resource conditions, functions, and values; and applying equivalent standards to each type of compensatory mitigation. The compensatory mitigation options under consideration will be evaluated based on their likelihood for ecological success and sustainability, their location relative to the impact site, their significance within the local and/or regional landscape of the Central Valley, and their anticipated costs. The compensatory mitigation requirements will be commensurate with the amounts and types of impacts on resources that are associated with their specific permits and permitting agencies.

The components of this Draft Compensatory Mitigation Plan are subject to continued development and refinement as Federal Railroad Administration (FRA) and the California High-Speed Rail Authority (Authority) work with the resource agencies to complete the compensatory mitigation planning process. As this planning process progresses, and following publication of the Final Environmental Impact Report/ Environmental Impact Statement (EIR/EIS), selection of the LEDPA, and continued agency coordination, these components will be fleshed out in more detail for the Final Compensatory Mitigation Plan.

1.2 Project Introduction

The Fresno to Bakersfield Section of the HST project would be approximately 114 miles long, varying in length by only a few miles depending on the route alternatives selected. To comply with the Authority's and FRA's guidance to use existing transportation corridors when feasible, the Fresno to Bakersfield HST Section would primarily be located adjacent to the existing BNSF Railway (BNSF) right-of-way. Alternative alignments are being considered where engineering constraints require deviation from the existing railroad corridor, and where necessary to avoid environmental impacts.

The Fresno to Bakersfield HST Section would cross both urban and rural lands and include a station in both Fresno and Bakersfield, a potential Kings/Tulare Regional Station in the vicinity of Hanford, a potential heavy maintenance facility (HMF), and power substations along the alignment. The HST alignment would be entirely grade-separated, meaning that crossings with roads, railroads, and other transport facilities would be located at different heights (overpasses or underpasses) so that the HST would not interrupt nor interface with other modes of transport. The HST right-of-way would also be fenced to prohibit public or vehicle access. The project footprint would primarily consist of the train right-of-way, which would include both a northbound and southbound track in an area typically 120 feet wide. Additional right-of-way would be

required to accommodate stations, multiple track at stations, maintenance facilities, and power substations.

The Fresno to Bakersfield Section would include at-grade, below-grade, and elevated track segments. The at-grade track would be laid on an earthen rail bed topped with rock ballast approximately 6 feet off the ground; fill and ballast for the rail bed would be obtained from permitted borrow sites and quarries. Below-grade track would be laid in an open or covered trench at a depth that would allow roadway and other grade-level uses above the track. Elevated track segments would span long sections of urban development or aerial roadway structures and consist of steel truss aerial structures with cast-in-place reinforced-concrete columns supporting the box girders and platforms. The height of elevated track sections would depend on the height of existing structures below, and would range from 40 to 80 feet. Columns would be spaced 60 to 120 feet apart.

1.2.1 Initial Construction Segment/Permitting Phase I

The Fresno to Bakersfield Section of the HST Project consists of one preferred alignment from the Downtown Fresno Station to the Downtown Bakersfield Station, a distance of approximately 114 miles. At this time, the Authority is only seeking agency approvals for the first approximately 100 miles of the preferred alignment. This Initial Construction Segment of the overall Project is referred to as Permitting Phase 1 (PP1) of the Fresno to Bakersfield Section. The southern terminus of PP1 is at 7th Standard Road, near Crome in Kern County.

The construction footprint of PP1 will include all of the HST right-of-way and associated facilities such as, traction-power substations and switching and paralleling stations, as well as the shifts in roadway rights-of-way, overcrossings, undercrossings, and interchanges that would be modified to accommodate the Fresno to Bakersfield Section of the HST Project. These project elements are described in Chapter 2 of the final EIR/EIS and below. Regulatory permit applications for Sections 404 and 401 of the Clean Water Act and Sections 2081 and 1602 of the California Fish and Game Code will be limited to PP1 of the Fresno to Bakersfield Section of the HST Project.

1.3 Project Alternatives

This section describes the Fresno to Bakersfield HST Section project alternatives, including the No Project Alternative. The Project EIR/EIS for the Fresno to Bakersfield HST Section examines alternative alignments, stations, and HMF sites within the general BNSF corridor. Discussion of the HST project alternatives begins with a single continuous alignment (the BNSF Alternative) from Fresno to Bakersfield. This alternative most closely aligns with the preferred alignment identified in the Record of Decision (ROD) for the Final Program Environmental Impact Report and Environmental Impact Statement for Proposed California High Speed Train System (Statewide Program EIR/EIS) (Authority and FRA 2005). Descriptions of the additional eight alternative alignments to the BNSF Alternative for portions of the route then follow. These alternative alignments were selected to avoid environmental, land use, or community issues identified for portions of the BNSF Alternative (Figure 1-1).

1.3.1 No Project Alternative

Under the No Project Alternative, the HST System would not be built. The No Project Alternative represents the condition of the Fresno to Bakersfield Section as it existed in 2009 (when the Notice of Preparation was issued), and as it would exist without the HST project at the planning horizon (2035). In assessing future conditions, it was assumed that all currently known programmed and funded improvements to the intercity transportation system (highway, rail, and transit), and reasonably foreseeable local development projects (with funding sources identified), would be developed by 2035.

Throughout the project development process, the Authority and FRA sought to balance the regulatory need to minimize and avoid the use of fill materials in waters of the U.S. with the project's purpose and need, design, engineering, cost, and other environmental criteria. Despite adherence to a rigorous alternatives screening and evaluation process, the Authority and FRA are unable to identify a practicable No Fill Alternative.

1.3.2 Component of the Alternatives

This section describes the rail line, rail corridor improvements, crossings and crossing improvements, bridges, elevated rail sections, station improvements, intermodal connections, and maintenance facilities of the alternatives in the Fresno to Bakersfield Section of the HST. The composition of the construction and project footprints are described in Chapter 2 of the Revised DEIR/Supplemental DEIS, and the footprints are shown in detail in the 15% Engineering Design Plans (Volume III of the Revised DEIR/Supplemental DEIS) (Authority and FRA 2012f).

Project components include the HST right-of-way and associated facilities such as traction-power substations, switching and paralleling stations, as well as the shifts in roadway rights-of-way associated with those facilities, including overcrossings and interchanges that would be modified or shifted to accommodate the HST Project.

The components of electrification and power for HST are: 1) the overhead contact system (OCS), which is the wiring system above the track that electrifies the train; 2) the traction power substations, which is the power supply system that provides power to the OCS; and 3) the electrical support facilities. Four electrical support facility types are required: switching stations, paralleling stations, backup and emergency power supply sources and signaling and train control elements. Facilities supporting maintenance, including one maintenance-of-way facility, would be required along the HST right-of-way. These facilities are described more fully in Chapter 2, Alternatives, of the Revised DEIR/Supplemental DEIS (Authority and FRA 2012f).

The Project will include three stations, located in the city of Fresno, Kings/Tulare County region, and city of Bakersfield. Station areas will include intermodal connectivity, drop-off facilities, an entry plaza, a station house area for ticketing and support services, a station box where passengers wait and access the HST, and parking facilities.

All alternatives must be able to transport passengers between San Francisco and Los Angeles in no more than 2 hours and 40 minutes. Projected ridership is based on assumptions of a ticket price relative to airfare and is forecast to be similar for all alternatives in the Fresno to Bakersfield Section. Because the Fresno to Bakersfield HST alignment alternatives are located along the same corridor, travel times by alternative are similar. The Proposed Preferred Alternative offers a travel time of 34 minutes and five seconds between Fresno and Bakersfield, a time consistent with the average travel time of all possible combinations of alternatives for the Fresno to Bakersfield Section. Selection of the Bakersfield Hybrid Alternative would add an additional 1 minute to the travel time for the Bakersfield to Palmdale Section because of the connection in Bakersfield.

The dedicated, fully grade-separated right-of-way needed to operate HSTs has more stringent alignment requirements than those of lower-speed trains. The HST would use four different track profiles: at-grade, where tracks are near the ground; retained fill, where higher tracks are elevated on retained earth; retained cut, where the HST crosses under existing roads or highways; and elevated, where the HST travels over existing roadways and railroads on structures supported by piers. Types of bridges that might be built include full channel spans, large box culverts, or, for some larger river crossings, piers within the ordinary high-water channel.

1.3.3 Alignment Alternatives

The Revised DEIR/Supplemental DEIS (Authority and FRA 2012f) evaluates 10 right of way alternatives: the No Project Alternative, one end-to-end alternative (the BNSF Alternative, which follows the route of the existing BNSF railway), and 8 alternative alignment bypasses: Hanford West Bypass 1 (at-grade and below-grade options), Hanford West Bypass 2 (at-grade and below-grade options), Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, Wasco-Shafter Bypass, Bakersfield South, and Bakersfield Hybrid.

In some areas, where no bypass alternative was evaluated, the BNSF Alternative is the only alignment alternative. These portions of the BNSF Alternative are referred to as the “common components.” In other areas, the alignment alternatives bypass existing communities. The bypass alternatives are depicted in Figure 2-1.

Two alternative station sites were under consideration in Fresno. The Fresno Station–Mariposa Alternative would be centered on Mariposa Street and bordered by Fresno Street on the north, Tulare Street on the south, H Street on the east, and G Street. The Fresno Station–Kern Alternative is similarly situated in Downtown Fresno and would be located on the BNSF Alternative, centered on Kern Street between Tulare Street and Inyo Street. This station would include the same components as the Fresno Station–Mariposa Alternative, but under this alternative, no station facilities would be located adjacent to the historic Southern Pacific Railroad depot and the relocation of existing Greyhound facilities would not be required. The Mariposa Alternative is the preferred station for Fresno because it provides the best opportunity for enhancement of land use densities consistent with the city’s current planning for transit-oriented development. Station locations in Hanford and Bakersfield are correlated with alignment alternatives, because each alignment alternative can only be served by its corresponding station location. These station locations are discussed with their corresponding alignment alternatives below.

1.3.3.1 Description of Hanford Area Alternatives

The Hanford area has three alternatives: the BNSF–Hanford East Alternative, the Hanford West Bypass 1 Alternative, and the Hanford West Bypass 2 Alternative. These alternatives begin in the north of the Fresno to Bakersfield Section at approximately East Elkhorn Avenue in Fresno County and continue south to Nevada Avenue in Kings County.

BNSF–Hanford East Alternative

The BNSF–Hanford East Alternative elevates where it crosses from the western side to the eastern side of the BNSF tracks near East Conejo Avenue. It then diverges from the BNSF corridor and runs at-grade with bridges over Cole Slough, Dutch John Cut, and Kings River into Kings County. The alternative passes east of the city of Hanford, parallel to SR 43, and south of Hanford in the vicinity of Idaho Avenue curves to the west and then south back toward the BNSF right-of way. The alternative rejoins the BNSF right-of-way on its western side just north of Corcoran.

Selection of the BNSF-Hanford East Alternative would result in selection of the Kings/Tulare Regional Station–East Alternative, because it is the only potential station location that is associated with this segment of the alignment. The Kings/Tulare Regional Station–East Alternative would be located east of SR 43 (Avenue 8) and north of the San Joaquin Valley Railroad on the BNSF Alternative. The station building would be approximately 40,000 square feet with a maximum height of approximately 75 feet. The entire site would be approximately 25 acres, including 8 acres designated for the station, bus bays, short-term parking, and kiss-and-ride areas. An additional approximately 17.25 acres would support a surface parking lot with

approximately 2,280 spaces. The balance of parking spaces necessary to meet the 2035 parking demand (2,800 total spaces) would be accommodated in downtown Hanford, Visalia, and/or Tulare, with local transit or shuttle services connecting with the station. Reducing the number of parking spaces provided at the station would allow for more open space areas, discourage growth at the station, encourage revitalization of the downtowns of Hanford, Visalia, and/or Tulare, and contain the development footprint of the station.

Hanford West Bypass 1 Alternative

The Hanford West Bypass 1 Alternative diverges from the BNSF corridor just south of East Elkhorn Avenue, ascends onto an elevated structure just south of East Harlan Avenue, crosses over Murphy Slough and the Kings River complex, and passes the community of Laton to the west. The alternative then continues at-grade, traveling between the community of Armona to the west and the city of Hanford to the east on a southeasterly route toward the BNSF corridor. The alternative rejoins the BNSF corridor adjacent to its western side at about Lansing Avenue. The alternative continues on the western side of the BNSF corridor and ascends onto another elevated structure, traveling over Cross Creek and special aquatic features that exist north of Corcoran and returning to grade just north of Nevada Avenue.

The Hanford West Bypass 1 Alternative would include the at-grade Kings/Tulare Regional Station–West Alternative. It would include a station building of approximately 100,000 square feet with a maximum height of approximately 36 feet. The entire site would be approximately 48 acres, including 6 acres designated for the station, bus bays, short-term parking, and kiss-and-ride areas. Approximately 5 acres would support a surface parking lot with approximately 700 spaces. An additional 3.5 acres would support two parking structures with a combined parking capacity of 2,100 spaces.

Below-grade option: The Hanford West Bypass 1 Alternative has a below-grade design option where the alignment would be below-grade between Grangeville Boulevard and Houston Avenue. Under this option, the alignment travels below-grade in an open cut with side slopes as it transitions to a retained-cut profile, approximately 40 feet below ground level. As the alignment transitions back to grade just north of Houston Avenue, the open-cut profile is used once more.

The below-grade Kings/Tulare Regional Station–West Alternative would include a station building of approximately the same size and height as the above-grade option. The below-grade station site would include the same components as the at-grade station option on the same number of acres; however, the station platform would be located below-grade instead of at ground level. Approximately 4 acres would support a surface parking lot with approximately 600 spaces and an additional 4 acres would support two parking structures with a combined parking capacity of 2,200 spaces.

Hanford West Bypass 2 Alternative

The Hanford West Bypass 2 Alternative is the same as the Hanford West Bypass 1 Alternative from East Kamm Avenue to just north of Jackson Avenue. At that point, the Hanford West Bypass 2 Alternative curves away from the Hanford West Bypass 1 Alternative to travel to the east at the intersection of Kent and Eleventh avenues toward the BNSF corridor. The alternative ascends over Kent Avenue, crosses over the BNSF right-of-way parallel to the BNSF tracks, and crosses over Kansas Avenue before returning to grade north of Lansing Avenue and continuing along the BNSF corridor on its eastern side. The Hanford West Bypass 2 Alternative, at-grade, would include the same at-grade Kings/Tulare Regional Station–West Alternative described for the Hanford West Bypass 1 Alternative, at grade.

Below-grade option: The Hanford West Bypass 2 Alternative has the same below-grade option between Grangeville Boulevard and Houston Avenue as the Hanford West Bypass 1 Alternative

and the same below-grade Kings/Tulare Regional Station–West Alternative described for the Hanford West Bypass 1 Alternative, below grade.

1.3.3.2 Description of Corcoran Area Alternatives

The Corcoran area has three alternatives: the BNSF–Through Corcoran Alternative, the Corcoran Elevated Alternative, and the Corcoran Bypass Alternative. These alternatives begin north of Corcoran at approximately Nevada Avenue and continue south until Avenue 136.

BNSF–Through Corcoran Alternative

The BNSF–Through Corcoran Alternative follows the BNSF right-of-way on its western side through the community of Corcoran and travels through the eastern edge of the city. The majority of this part of the alignment passes through agricultural land except where it travels through Corcoran. The alignment continues at-grade until Patterson Avenue, where it ascends onto an elevated structure over Brokaw Avenue, Whitley Avenue, a BNSF spur, and agricultural facilities at the southern end of the city. The alternative then returns to grade and parallels the BNSF corridor.

Corcoran Elevated Alternative

The Corcoran Elevated Alternative is the same as the corresponding section of the BNSF–Through Corcoran Alternative from approximately Nevada Avenue to Avenue 136, except that it passes through Corcoran on the eastern side of the BNSF right-of-way on an aerial structure. The aerial structure begins at Niles Avenue and returns to grade south of Fourth Avenue.

Corcoran Bypass Alternative

The Corcoran Bypass Alternative diverges from the BNSF corridor at Nevada Avenue and swings east of Corcoran, rejoining the BNSF route at Avenue 136. The majority of the Corcoran Bypass Alternative is at-grade except for one elevated structure that crosses over SR 43, the BNSF tracks, and the Tule River.

1.3.3.3 Description of Allensworth Area Alternatives

The Allensworth area has two alternatives: the BNSF–Through Allensworth Alternative and the Allensworth Bypass Alternative. These alternatives begin at approximately Avenue 84 and continue until around Taussig Avenue.

BNSF–Through Allensworth Alternative

This alternative follows the BNSF corridor and passes through both the Allensworth Ecological Reserve and the Allensworth Historic District/Colonel Allensworth State Historic Park. It continues to follow the BNSF corridor until it elevates over the Tule River, Deer Creek, and the Stoil railroad spur from the BNSF corridor.

Allensworth Bypass Alternative

The Allensworth Bypass Alternative avoids both the Allensworth Ecological Reserve and the Allensworth Historic District/Colonel Allensworth State Historic Park. This alternative begins at Avenue 84 and rejoins the BNSF–Through Allensworth Alternative at Elmo Highway. The Allensworth Bypass Alternative would only be constructed on an elevated structure where the alignment crosses Deer Creek and the Stoil railroad spur.

1.3.3.4 Description of Wasco-Shafter Area Alternatives

The Wasco-Shafter area has two alternatives: the BNSF–Through Wasco-Shafter Alternative and the Wasco-Shafter Bypass Alternative. These alternatives begin around Taussing Avenue and continue until the alignment reaches Bakersfield.

BNSF–Through Wasco-Shafter Alternative

The BNSF–Through Wasco-Shafter Alternative is at-grade and parallels the BSNF Railway corridor as it passes through Wasco. The alternative elevates at First Street and closely follows the western side of the BNSF right-of-way until just south of Wasco, where it crosses to the eastern side of the BNSF tracks and returns to an at-grade profile. The alternative continues on the eastern side of the BNSF right-of-way through Shafter, once again elevates at Cherry Avenue, crosses over once more to the western side of the BNSF right-of-way, where it returns to an at-grade profile and follows the BNSF right-of-way into Bakersfield.

Wasco-Shafter Bypass Alternative

The Wasco-Shafter Bypass Alternative diverges from the BNSF–Through Wasco-Shafter Alternative between Taussig Avenue and Zachary Avenue, crosses over to the eastern side of the BNSF tracks, and bypasses Wasco and Shafter to the east. The Wasco-Shafter Bypass Alternative is at-grade except where it travels over Seventh Standard Road and the BNSF tracks to rejoin the common alignment.

1.3.3.5 Description of Bakersfield Area Alternatives

The Bakersfield area has three alternatives: the BNSF–Bakersfield North Alternative, the Bakersfield South Alternative, and the Bakersfield Hybrid Alternative. These alternatives begin at the north boundary of the City of Bakersfield and continue to the terminus of the alternatives at Oswell Street.

BNSF–Bakersfield North Alternative

The BNSF–Bakersfield North Alternative runs at-grade and follows both the BNSF corridor and SR 58 into Bakersfield. Although the alternative generally follows the BNSF corridor through Bakersfield, it elevates at Country Breeze Place and continues as an elevated structure all the way to the project terminus at Oswell Street.

The Bakersfield Station–North Alternative would be located at the corner of Truxtun and Union Avenue/SR 204 on the BNSF Alternative. Access to the site would be from Truxtun Avenue, Union Avenue, and S Street. Two new boulevards would be built from Union Avenue and S Street to access the station and the supporting facilities. The three-level station building would be 52,000 square feet, with a maximum height of approximately 95 feet. The entire site would consist of 19 acres, with 11.5 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride areas. An additional 7.5 acres would house two parking structures with a planned capacity of approximately 4,500 cars, In addition, another 175 spaces would be provided in surface lots. The balance of the supply necessary to accommodate the full 2035 parking demand would be provided through surface lots and the use of underutilized facilities around the station and in Downtown Bakersfield, identified as a part of a comprehensive parking strategy developed in coordination with the City of Bakersfield.

Bakersfield South Alternative

The Bakersfield South Alternative runs at-grade as it follows both the BNSF corridor and SR 58 into Bakersfield. It parallels the BNSF–Bakersfield North Alternative until Chester Avenue, where

it curves south and then parallels California Avenue. As with the BNSF–Bakersfield North Alternative, the Bakersfield South Alternative begins at-grade but elevates at Country Breeze Place and continues as an elevated structure all the way to the project terminus at Oswell Street.

The Bakersfield Station–South Alternative would be in the same area as the North Station Alternative, but would be situated along Union and California avenues, just south of the BNSF Railway right-of-way. Access to the station site would be from two new boulevards: one branching off from California Avenue, and the other from Union Avenue. The two-level station building would be approximately 51,000 square feet, with a maximum height of approximately 95 feet. The entire site would be 20 acres, with 15 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride areas. Five of the 20 acres would support one six-level parking structure with a capacity of approximately 4,500 cars. In addition, another 500 spaces would be provided in surface lots, with the balance of the supply necessary to accommodate the full parking demand to be identified as a part of a comprehensive parking strategy developed in coordination with the City of Bakersfield.

Bakersfield Hybrid Alternative

The Bakersfield Hybrid Alternative runs at-grade as it follows both the BNSF corridor and SR 58 into Bakersfield. It parallels the Bakersfield South Alternative until approximately A Street, where it diverges from the Bakersfield South Alternative, crosses over Chester Avenue and the BNSF right-of-way in a southeasterly direction, then curves back to the northeast to parallel the BNSF tracks toward Kern Junction. After crossing Truxtun Avenue, the alignment curves to the southeast to parallel the UPRR tracks and Edison Highway to its terminus at Oswell Street. As with the BNSF–Bakersfield North and the Bakersfield South alternatives, the Bakersfield Hybrid Alternative begins at-grade but elevates at Country Breeze Place and continues as an elevated structure all the way to the project terminus at Oswell Street.

The Bakersfield Station–Hybrid Alternative would be located at the corner of Truxtun and Union Avenue/SR 204 (Figure 2-9). The entire site would be approximately 24 acres, with 15 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride areas. Approximately 4.5 of the 24 acres would support three parking structures with a total capacity of approximately 4,500 cars. An additional 460 parking spaces would be provided in surface lots covering a total of approximately 4.5 acres of the station site. The balance of the supply needed to accommodate the full 2035 parking demand (8,100 total spaces) would be identified as a part of a comprehensive parking strategy developed in coordination with the City of Bakersfield.

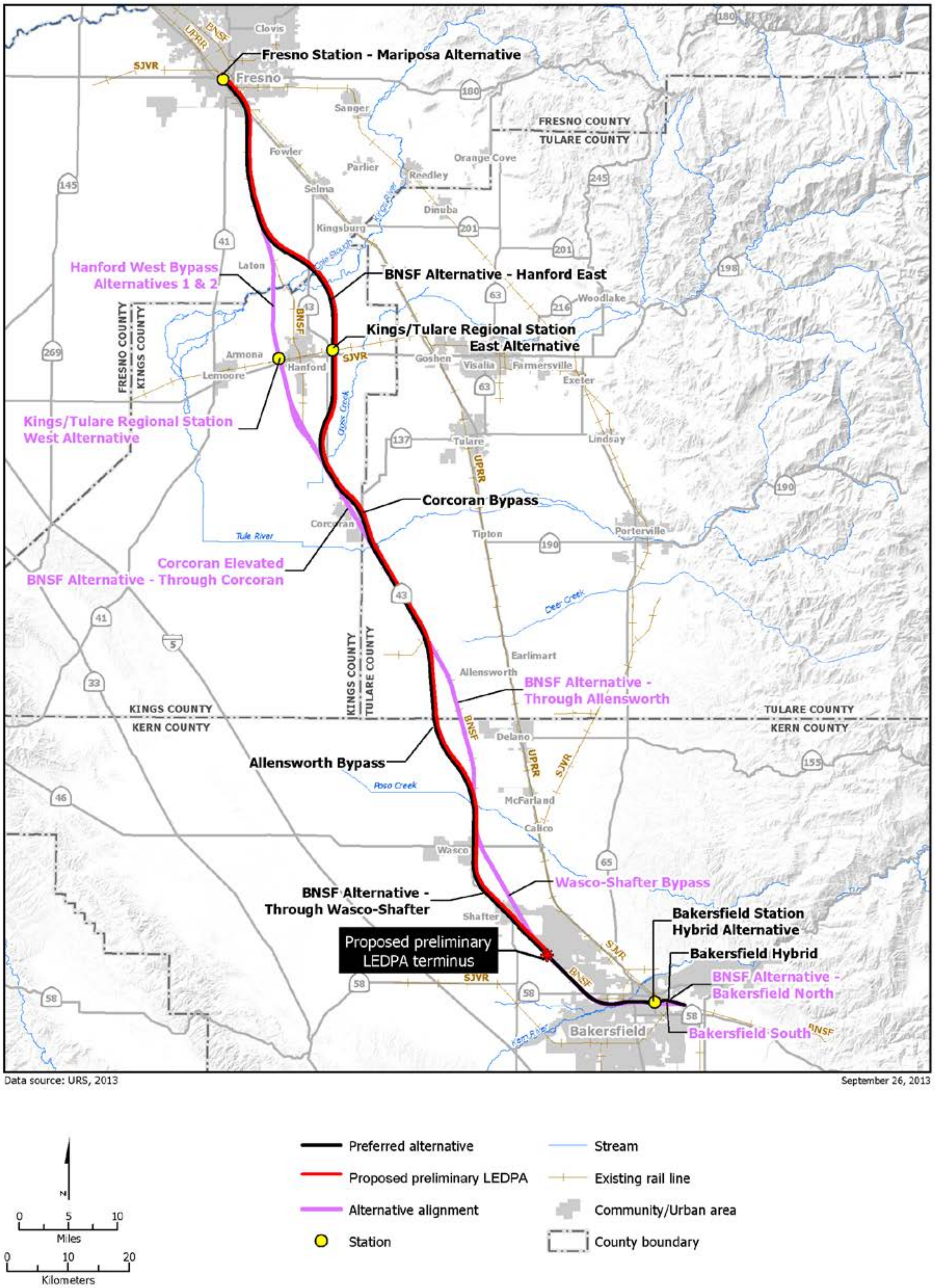

Figure 1-1
Fresno to Bakersfield HST alignments

1.4 Study Areas

To define the extent of the various project features for all of the Fresno to Bakersfield Section, this plan uses several distinct but related terms, such as project footprint and study area. Each of these areas may have a different extent based on the resource (e.g., jurisdictional waters, biological resources) under consideration. The definitions of the various study areas, special-status species, jurisdictional waters, and special-status plant communities are provided in the following subsections.

- The project footprint is the area directly affected by the proposed project activities. The project footprint is the same for all biological resource disciplines. The project footprint includes the stations, tracks, maintenance and equipment storage areas, temporary access roads, road overcrossings, substations, and related features.

- The study area encompasses the entire potential area of disturbance associated with the project footprint, including the proposed HST right-of-way and associated facilities (traction power substations, switching and paralleling stations, and areas associated with modifying or relocating roadways for those facilities—including overcrossings and interchanges), the station alternatives, the HMF site alternatives, and construction areas (including laydown, storage, and similar areas). The study areas for the various biological resources include a varied buffer and are described as the Wetland Study Area, the Special-Status Plant Study Area, and the Habitat Study Area. Because of the methods used during the investigation, the Habitat Study Area is further divided into a core, auxiliary, and supplemental Habitat Study Area. These areas are further described in Section 1.7.1.

1.4.1 Resource Study Areas

The study areas for the various biological resources (jurisdictional waters, plants, wildlife, and habitats that occur or have the potential to occur in the study area) are as follows:

- The Wetland Study Area is the project footprint plus a 250-foot buffer to evaluate direct and indirect impacts on wetlands and special-status wildlife using vernal pools. Direct impacts on wetlands are within the project footprint and indirect impacts are within the 250-foot buffer.

- The Special-Status Plant Study Area is the project footprint to evaluate direct and indirect impacts plus a 100-foot buffer to evaluate indirect impacts on sensitive plant resources (including special-status plants, special-status plant communities, protected trees, and elderberry shrubs).

- The Habitat Study Area is the project footprint plus a 1,000-foot buffer (review of aerial photos only if between 250 feet and 1,000 feet from buffer) to evaluate direct and indirect impacts on habitats and the special-status wildlife species that use them. The Habitat Study Area was divided into two areas: a core Habitat Study Area and an auxiliary Habitat Study Area. A third, or supplemental, Habitat Study Area was identified for select species that required further analysis based on agency- or protocol-recommended species-specific buffers:

  – The core Habitat Study Area includes the proposed project footprint and a 250-foot buffer. This was the area that was physically surveyed.

  – The auxiliary Habitat Study Area, which extends from the edge of the core area laterally 750 feet, was surveyed through extrapolation of observations made in the core Habitat Study Area, from aerial photograph interpretation, and in windshield surveys.

– The supplemental Habitat Study Area extends laterally from the project footprint up to 1.24 miles, depending on the target species, and identifies species-specific habitats based on aerial photograph interpretation, documented occurrences of the species, and observations of special-status species and their habitats made in the field.

1.5 Mitigation Planning History

1.5.1 Consultation History

The following agency coordination and professional contacts contributed to the development of this report:

Throughout 2010 and 2011, URS/HMM/Arup Joint Venture biologists Matthew Bettelheim, Justin Whitfield, and Jessie Golding were in contact with California State University, Stanislaus, Endangered Species Recovery Plan biologist Brian Cypher, Ph.D., to guide the design and placement of suitable wildlife crossing structures (Cypher 2010–2012, personal communication).

During the spring 2010 field surveys, URS/HMM/Arup Joint Venture biologist Matthew Bettelheim was contacted by California Department of Fish and Wildlife (CDFW) biologist Annee Ferranti, manager of the Allensworth Ecological Reserve. Ms. Ferranti and CDFW biologist Krista Tomlinson later prepared an informal list detailing the biological resources known by the CDFW in the Allensworth Ecological Reserve (Tomlinson 2010, personal communication).

On September 23, 2010, a meeting with the various regulatory agencies was held regarding the Central Valley HST sections (San Jose to Merced, Merced to Fresno, and Fresno to Bakersfield) to discuss development of a comprehensive mitigation strategy.

On October 29, 2010, URS/HMM/Arup Joint Venture biologist Justin Whitfield and soil scientist Jan Novak discussed U.S. Army Corps of Engineers (USACE) permitting and compensatory mitigation with Zach Simmons and Leah Fischer of the USACE. They discussed the lack of USACE-approved wetland banks in the Tulare Basin and discussed the possibility of creating a permittee-responsible mitigation site and other mitigation options, including preservation as part of a mitigation suite.

On November 10, 2010, URS/HMM/Arup Joint Venture met with representatives of the U.S. Fish and Wildlife Service (USFWS) and CDFW to discuss survey methods, impacts on special-status wildlife species, approach to impacts, permitting efforts, and avoidance, minimization, and compensatory mitigation.

On April 26, 2011, URS/HMM/Arup Joint Venture biologists met with representatives of the USFWS, CDFW, USACE, U.S. Environmental Protection Agency (EPA), and Tulare Basin Working Group to discuss mitigation opportunities pertaining to Conceptual Area Protection Plans (CAPPs) and to solicit input on identifying and prioritizing lands for compensatory mitigation.

Throughout 2010 and 2011, URS/HMM/Arup Joint Venture biologists Justin Whitfield, Matthew Bettelheim, and Rebecca Verity were in contact with local, non-profit organizations to identify potential mitigation sites in the San Joaquin Valley. Between June and August of 2011, Mr. Bettelheim again contacted local, non-profit organizations as part of the preparation of the draft HST Fresno to Bakersfield Section Compensatory Mitigation Plan. The current status and availability of mitigation and/or conservation credits at existing mitigation banks was determined through calls to Sequoia Riverlands Trust, Wildlands, Inc., Westervelt Ecological Services, the Kern Water Bank Authority, and the Conservation Land Group. Additional opportunities for mitigation through conservation/mitigation banking, conservation easements, fee-title acquisitions, in-lieu fee programs, or other mitigation options were solicited through calls to the

Tulare Basin Wetlands Association, the Tulare Basin Wildlife Partners, Ducks Unlimited, the Center for Natural Lands Management, The Nature Conservancy, and Hansen's Biological Consulting.

On November 22, 2011, the regional consultants (RCs) from the San Jose to Merced, Merced to Fresno, and Fresno to Bakersfield sections met with Authority and FRA representatives, agency representatives (USACE, EPA, Regional Water Quality Control Board [RWQCB], National Marine Fisheries Service [NMFS], and CDFW), appropriate wildlife refuge managers, and regional experts Dr. Bob Holland and Dr. Brian Cypher. The meeting agenda focused on both the Merced to Fresno and the Fresno to Bakersfield sections of the HST program; the RCs reviewed the potential compensatory mitigation options identified to date, addressed the mitigation challenges and opportunities common to both sections, and discussed projected schedules for completion of the mitigation process.

The RCs from the Merced to Fresno and Fresno to Bakersfield teams met on November 29, 2011, with Dan Russell of USFWS, who was unable to make the November 22, 2011, Mitigation Working Group meeting. The RC's from both sections presented the same information conveyed at the previous meeting and obtained feedback and action items.

On December 2, 2011, the URS/HMM/Arup Joint Venture biologists introduced the *Conceptual Mitigation Plan* proposal and requested USFWS feedback regarding compensatory mitigation options for federally listed species in the Central Valley.

On March 2, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, CDFW, and USFWS to discuss information needs for the issuance of the USFWS Biological Opinion and CDFW Incidental Take Permit for the HST sections.

On March 5, 2012, Ben Watson of USFWS confirmed by email to URS/HMM/Arup Joint Venture biologists that impacts to suitable habitat for the California tiger salamander (*Ambystoma californiense*) could be mitigated through the purchase of conservation bank credits at an approved and established bank such as the Sand Creek Conservation Bank.

On March 28, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, FRA, CDFW, and USFWS to discuss wildlife movement and habitat connectivity and get agency feedback regarding engineering and mitigation options to facilitate landscape permeability in the Central Valley.

On April 18, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority and CDFW to introduce the layout, covered species, and avoidance and minimization measures proposed in the Incidental Take Permit applications for the Merced to Fresno and Fresno to Bakersfield sections.

On June 6, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, CDFW, and USFWS to review seven prospective mitigation site prospectuses and title reports to determine species presence and survey needs at each location as well as overall site suitability as a mitigation/conservation site.

On July 6, 2012, FRA and the Authority requested formal consultation for the Fresno to Bakersfield Section and submitted the Biological Assessment for the project.

On July 17, 2012, URS/HMM/Arup Joint Venture biologists met with Ben Watson of USFWS to discuss project alternatives, project components, survey methodology, environmental setting, effects to federally listed species, and compensatory mitigation options as presented in the Biological Assessment.

On July 25, 2012, Ben Watson of USFWS confirmed by email to URS/HMM/Arup Joint Venture biologists that a case can be made to infer the presence of vernal pool fairy shrimp (*Branchinecta lynchi*) on lands adjacent and hydrologically connected to the Allensworth Ecological Reserve, where the presence of this species has been confirmed by CDFW.

On August 8, 2012, the Authority submitted an administrative draft 2081 Incidental Take Permit to CDFW.

On August 15, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, USACE, EPA, and wetlands specialist Chad Roberts to provide an introductory overview of the California Rapid Assessment Method (CRAM) and Wetland Evaluation Report (prepared on behalf of the Checkpoint C process and the Compensatory Mitigation Plan).

On November 8–9, 2012, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, USFWS, and CDFW to review alignment alternatives and visit select prospective mitigation sites currently under consideration.

On February 12–13, 2013, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, USACE, and EPA to visit prospective mitigation sites currently under consideration.

On February 28, 2013, the Authority received a Biological Opinion from USFWS.

On May 21–22, 2013, URS/HMM/Arup Joint Venture biologists met with representatives of the Authority, USFWS, and CDFW to visit prospective mitigation sites currently under consideration.

1.5.2 Field Surveys

The potential for project impacts on biological resources depends largely on the presence of suitable habitat in and adjacent to areas that would be affected by the project. Project biologists conducted field surveys to determine the presence of biological resources and to document the location of any biological resources through habitat characterization and mapping. Habitat characterization and mapping were conducted throughout the study area where access was granted and where properties were accessible. Where permission to enter was not granted, field crews used public roads and adjacent parcels to characterize and map biological resources. Access was granted to approximately 40% of the study area. Visual surveys were conducted to compare background information with existing data and aerial signatures identified in high-resolution aerial imagery. The primary field surveys discussed in this section were conducted in spring and summer 2010. Supplemental surveys were conducted in spring 2011 in response to engineering design changes.

The *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2011b, 2012c) provides detailed descriptions of the various methods employed during the field surveys for biological resources. The various field surveys were conducted according to the methodologies described in the *California High-Speed Train Central Valley Biological Resources and Wetlands Survey Plan* (Authority and FRA 2011a), which was prepared, in part, for the Fresno to Bakersfield Section of the HST.

Botanical Surveys

Field surveys for special-status plants were conducted during the growing season (March, April, May, and in select areas in June) in accordance with the *California Native Plant Society Botanical Survey Guidelines* (CNPS 2001), the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996a), and the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). In addition, where applicable, surveys for the five federally

listed species—Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), California jewelflower (*Caulanthus californicus*), Hoover's woolly-star (*Eriastrum hooveri*), Kern mallow (*Eremalche kernensis*), and San Joaquin woolly-threads (*Monopolies congdonii*)—complied with the supplemental guidance provided in *General Rare Plant Survey Guidelines* and the supplemental survey methods appendices (ESRP 2002).

Special-Status Wildlife Species

Field surveys were conducted to map and identify the habitats (i.e., biological communities and land use cover types) in the Habitat Study Area in accordance with *A Guide to Wildlife Habitats of California* and the California Wildlife Habitat Relationship System (CDFG 1988, 2008a). The California Wildlife Habitat Relationship System is a biological community-based model that associates California's wildlife species to standard habitats (e.g., biological communities that support plant and wildlife species) and rates suitability for reproduction, cover, and feeding. The field surveys were conducted to identify potentially suitable wildlife habitat for special-status wildlife species. Key habitat constituents mapped during field surveys included topography and the presence or absence of vegetative cover, foraging habitat, and migration barriers (i.e., canals and roadways). Focused surveys were not conducted. Detailed information, including recommendations for focused surveys, is presented in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

Jurisdictional Delineations

Jurisdictional delineations were conducted on accessible parcels during spring and summer 2010. The jurisdictional delineation was conducted for the purpose of obtaining a *Preliminary Jurisdictional Delineation* according to USACE's *Regulatory Guidance Letter 08-02* (USACE 2008c). Wetlands in the Wetland Study Area were delineated using the methods described in the *Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Environmental Laboratory 1987; USACE 2008b). All wetlands were described using the Cowardin classification system (Cowardin et al. 1979).

Other waters of the United States (U.S.) in the Wetland Study Area were delineated using the methods described in *Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* and *USACE Regulatory Guidance Letter No. 05-05*, where appropriate (Lichvar and McColley 2008; USACE 2005).

No formal guidelines exist for the identification of the extent of waters of the state (RWQCB or CDFW jurisdiction). The extent of state-regulated areas in some instances extends beyond that of waters of the U.S. (above the ordinary high-water mark). For example, isolated water bodies and stream channels up to the top of the stream bank or to the riparian drip line all qualify as waters of the state. Methods associated with the wetland delineation study are discussed in detail in a separate *Fresno to Bakersfield Section: Preliminary Jurisdictional Waters and Wetlands Delineation Report* (Authority and FRA 2012d) and also in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

Permit Status

At present, numerous permits and/or authorizations are being prepared for submittal to the environmental resource agencies. In June 2011, FRA made a No Effect Determination for federally listed salmonid species regulated by the NMFS. On August 3, 2011, the NMFS submitted a formal letter to the Authority requesting additional information pursuant to a Section 7 consultation. The Authority and FRA responded to the NMFS on August 25, 2011, with the requested information and restated the No Effect Determination. In July 2011, the Clean Water Act Section 404 permit application was submitted to the USACE for review. In August 2011, the Draft EIR/EIS was released to the public; the public notice for the Section 404 individual permit

application was also published at that time. In September 2011, the draft Biological Assessment was submitted to USFWS.

In November 2011, the Authority determined that the proposed addition of the Hanford West Bypass Alternatives, the Bakersfield Hybrid Alternative, and refinements being considered for existing Fresno to Bakersfield alternatives warranted preparation and circulation of a Revised Draft EIR / Supplemental Draft EIS analyzing the potential environmental impacts that might result from the new alternatives and refinements to existing alternatives, pursuant to Section 15088.5 of the California Environmental Quality Act (CEQA) Guidelines.

The additional alternatives will have no effect on species regulated by the NMFS but required changes to the USFWS Biological Assessment and the USACE Section 404 permit application that were previously submitted. A new Biological Assessment was prepared to evaluate the adverse effects on federally listed species regulated by the USFWS. This Biological Assessment was submitted to the USFWS, along with a request to initiate formal consultation, on July 6, 2012. The USFWS issued a Biological Opinion for the project on February 28, 2013. The USACE issued a Preliminary Jurisdictional Determination for the Fresno to Bakersfield Section of the California High-Speed Train Project on February 5, 2013. This determination establishes all of the jurisdictional waters of the U.S. for the project. The Clean Water Act Section 404, California Fish and Game Code Section 1600 Lake and Streambed Alteration Agreement, and the Clean Water Act Section 401 water quality certification applications are currently being prepared for submission to the USACE, CDFW, and Central Valley RWQCB, respectively.

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Section 2.0
Impacts

2.0 Impacts

This chapter provides a description of the unavoidable temporary and permanent impacts on biological resources, including jurisdictional waters, special-status plant species, special-status wildlife species, and habitats of concern in the project footprint. All impacts reported represent the maximum potential impact anticipated as a result of the proposed Preferred Alternative project activities. For a more detailed definition and description of the methods used to calculate impacts on each resource, refer to Chapter 5 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

The impacts presented in this Section pertain to those biological resources that require offsite mitigation (described in further detail in Section 5.0). All impacts are presented as either temporary[1] and permanent[2] or direct and indirect[3], depending on the affected resource. Definitions of each type of impact are presented in each biological resource section below. All other impacts on biological resources (i.e., protected trees), such as those that only require onsite mitigation, are described in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

For the purposes of this Compensatory Mitigation Plan, project impacts and their associated mitigation will be addressed for the entire Fresno to Bakersfield Section. This approach maximizes ecological value because it may restore or conserve larger parcels and it also reduces administrative and management costs. However, depending on the Fresno to Bakersfield Section construction schedule, a phased approach may be required and would be implemented as necessary. As an example, the Merced to Fresno Section uses a “phased approach” in which, due to an accelerated construction schedule, the mitigation will be completed for each Construction Package commensurate with package-specific impacts.

Where feasible, engineering changes were made to the alternative alignment to avoid temporary and permanent impacts on biological resources, jurisdictional waters, special-status plant species, special-status wildlife species, and habitats of concern. For example, the information obtained in the course of the initial jurisdictional delineations, botanical surveys, and wildlife resource surveys was used to help site the Allensworth Bypass alignments in the vicinity of Allensworth State Historical Park and Allensworth Ecological Reserve to avoid significant impacts on areas of high-quality biological and wetland resources. Similarly, in the vicinity of the Corcoran Bypass and along the Wasco-Shafter Bypass, engineering changes were made to avoid impacts on the Tulare Lakebed Mitigation Site, on seasonal wetlands associated with Cross Creek, on historic properties potentially eligible for listing on the National Register of Historic Properties, and on local development plans. Some of the properties intentionally avoided through these engineering changes are now under consideration as potential mitigation properties.

[1] Construction Period Impacts – Temporary (short-term and long-term) impacts associated with the construction of the HST alternative. The construction period includes testing of the HST System prior to passenger service.

[2] Project Impacts – Permanent impacts related to the project operation and maintenance of the HST alternative. Project operations include HST System operations and related project improvements, such as roadway modifications, maintenance of power supply components, and maintenance of the HST, including the HMF site operations. Some permanent impacts initially occur during construction, but because they are permanent, they are associated with the project impacts (for example, conversion of agricultural lands to transportation uses).

[3] Direct impacts are changes caused by and immediately related to the project. Indirect impacts are changes in the environment that are caused by the project but that are removed in distance or time from the project.

2.1 Jurisdictional Waters

Wetlands, waters of the United States (U.S.), and waters of the state are regulated by the federal government (USACE) and the State of California (State Water Resources Control Board [SWRCB], RWQCB, and CDFW) and for purposes of this discussion are collectively termed jurisdictional waters. Focused surveys of jurisdictional waters were conducted in 2010 to determine the extent of jurisdictional water features within the project footprint. For further details about these surveys, refer to the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c) and the *Fresno to Bakersfield Section: Supplemental Preliminary Jurisdictional Waters and Wetlands Delineation Report* (Authority and FRA 2012e). On February 5, 2013, USACE issued a Preliminary Jurisdictional Determination to verify USACE jurisdictional waters.

2.1.1 Hydrological Setting

The jurisdictional waters within the project footprint are in the 17,400 square-mile Tulare Lake Basin, a generally flat basin used extensively and intensively for agriculture. The project footprint occurs within seven Hydrologic Unit Code (HUC) 8 watersheds (Figure 2-1):

- Upper Dry (18030009).
- Tulare–Buena Vista Lakes (18030012).
- Upper Kaweah (18030007).
- Upper Tule (18030006).
- Upper Deer–Upper White (18030005).
- Upper Poso (1803004).
- Middle Kern–Upper Tehachapi–Grapevine (1803003).

Excluding the Middle Kern–Upper Tehachapi–Grapevine watershed, the remaining six HUC 8 watersheds collectively constitute the Tulare–Buena Vista Lakes HUC 6 (180300) watershed. Hydrology of the jurisdictional waters within the project footprint is highly manipulated. Most of the surface water present in the jurisdictional features within the project footprint is diverted from the numerous irrigation canals that are found throughout the valley, with the exception of the significant drainages that cross the project footprint, including Kings River, Cross Creek, Deer Creek, Tule River, Poso Creek, and Kern River, some of which have sources in the foothills of the Sierra Nevada or large reservoirs upstream.

The majority of the jurisdictional features in the project footprint are man-made or significantly manipulated. Vernal pools in the project footprint south of the city of Corcoran and north of the city of Wasco are generally natural features.

Table 2-1a details the maximum anticipated temporary and permanent impacts on jurisdictional waters as a result of proposed FRA Preferred Alternative project activities and categorizes the impacts by watershed and feature type. Permanent impacts are impacts that would result in permanent fill, and temporary impacts are those that can be fully restored to pre-disturbance conditions following construction.

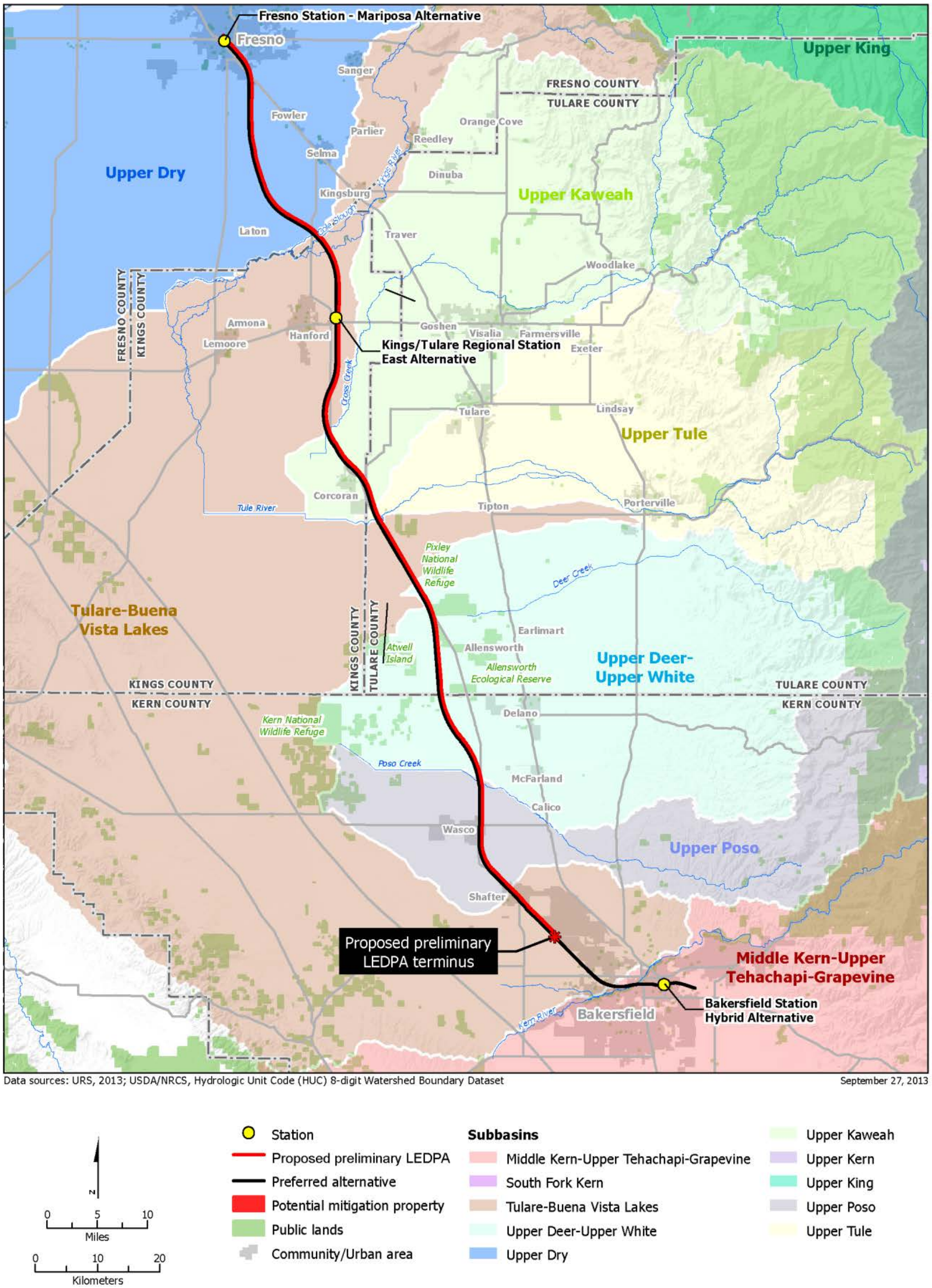

Figure 2-1
Watersheds

Table 2-1a
Impacts of the Preferred Alternative on Jurisdictional Waters (acres)

Jurisdictional Waters Type	Direct Impacts		Indirect Impacts [a]	
	Permanent	Temporary	Bisected [b]	Impact Totals [c, d]
Waters of the U.S.–Wetlands				
Emergent wetlands	—	—	—	—
Seasonal wetlands	1.56	1.01	—	2.57
Vernal pools and swales	5.63	—	11.54	17.17
Wetlands subtotal	7.19 [c]	1.01	11.54	19.74 [c]
Waters of the U.S.–Other Waters				
Canals/ditches	54.22	10.80	—	65.02
Man-made lacustrine	33.21	16.87	—	50.08
Seasonal riverine	2.08	0.48	—	2.56
Other waters of the U.S. subtotal	89.51 [c]	28.16	—	117.66 [c]
Total Waters of the U.S.				
Waters of the U.S. total	96.70 [c]	29.16	11.54	137.40
Riparian Areas				
Riparian	0.10	0.73	—	0.84

— = no impact or not applicable

Notes:

[a] Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.

[b] The subcategory "Bisected" quantifies impacts on features that are bisected by the boundary of the project footprint (i.e., where a vernal pool or swale straddles the boundary of the project footprint). This category presents the acreage for the portion of these features that lies outside the project footprint but within the 250-foot buffer.

[c] Calculations are based on raw, unrounded GIS source data. As a result, the subtotals and totals do not match the sum of the rounded feature values presented in the table.

[d] These impacts are based on the Proposed Preferred Alternative alignment (BNSF Alternative with Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives).

GIS = Geographic Information System

The Authority may apply for regulatory permits in distinct construction packages as funding becomes available or as necessary with respect to project schedule. Currently the Fresno to Bakersfield Section is divided into four distinct construction packages. Construction package 1c is from Santa Clara Street to East American Avenue in the city of Fresno, Construction Package 2/3 is from East American Avenue to a point 1 mile north of the Tulare/Kern County line, and Construction Package 4 is from 1 mile north of the Tulare/Kern County Line to Seventh Standard Road in Kern County. There is currently no funding for construction of the Fresno to Bakersfield Section for portions of the project south of Seventh Standard Road. A summary of aquatic resource and riparian impacts by Construction Package is provided as Table 2-1b.

Table 2-1b
Impacts of the Preferred Alternative on Jurisdictional Waters and Riparian Areas by Construction Package (acres)

Jurisdictional Waters Type	Direct Impacts		Indirect Impacts [a]	Impact Totals [c, d]
	Permanent	Temporary	Bisected [b]	
Construction Package 1c				
Wetlands	< 0.01	--	--	< 0.01
Other Waters of the U.S	0.45	3.09	--	3.54
Total Water of the U.S	**0.46**	**3.09**	--	**3.55**
Riparian Areas	--	--	--	--
Construction Package 2/3				
Wetlands	2.57	1.01	3.25	6.83
Other Waters of the U.S	84.19	20.86	--	105.06
Total Water of the U.S	**86.76**	**21.87**	**3.25**	**111.88**
Riparian Areas	0.04	0.72	--	0.76
Construction Package 4				
Wetlands	4.62	--	8.28	12.90
Other Waters of the U.S	4.86	4.21	--	9.07
Total Water of the U.S	**9.48**	**4.21**	**8.28**	**21.97**
Riparian Areas	0.07	0.01	--	0.08

— = no impact or not applicable

Notes:

[a] Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.

[b] The subcategory "Bisected" quantifies impacts on features that are bisected by the boundary of the project footprint (i.e., where a vernal pool or swale straddles the boundary of the project footprint). This category presents the acreage for the portion of these features that lies outside the project footprint but within the 250-foot buffer.

[c] Calculations are based on raw, unrounded GIS source data. As a result, the subtotals and totals do not match the sum of the rounded feature values presented in the table.

[d] These impacts are based on the Proposed Preferred Alternative alignment (BNSF Alternative with Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives).

GIS = Geographic Information System

2.2 Special-Status Plant Species

Special-status plant species are those species that are legally protected under the federal Endangered Species Act of 1973 (ESA) (federal ESA), the California Endangered Species Act (California ESA), or other regulations, such as those species that meet the definitions of rare or endangered under CEQA Guidelines Sections 15380 and 15125. Protocol-level botanical surveys were conducted in 2010 to determine whether special-status plant species occur within the

project study area. For further details about these surveys, refer to the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

Four special-status plant species were originally evaluated for their potential to occur in the region: California jewelflower, Kern mallow, San Joaquin woolly-threads, and Hoover's spurge (*Chamaesyce hooveri*). No federally or state-listed plant species were found during botanical surveys; however, suitable habitat that could support special-status plant species may occur on unsurveyed parcels. These parcels were not surveyed before the preparation of this draft document because permission to enter was not available. These lands will be surveyed before construction and if special-status plant species are found within the project footprint, impacts on these species will be mitigated through mitigation measures, as described in Sections 4.0 and 5.0.

2.3 Special-Status Wildlife Species

Special-status wildlife species are animals that are legally protected under the federal ESA (federally listed), the California ESA (state listed), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. A focused wildlife habitat assessment was conducted in March 2010 to determine whether special-status wildlife species and their suitable habitat occur within the core Habitat Study Area. For further details about this survey, refer to the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012c).

Direct impacts that require offsite mitigation are anticipated for a total of 10 special-status wildlife species. All impacts on special-status wildlife species were determined using a habitat-based approach where the presence of the species was assumed in suitable habitat. Habitats in the project footprint and vicinity were determined through a combination of background review, habitat mapping during field surveys, and aerial photograph interpretation, and classified using the wildlife habitat descriptions presented in *A Guide to Wildlife Habitats of California* (CDFG 2008b). Table 2-2 provides a summary of the impacts on special-status wildlife species for the FRA Preferred Alternative.

Impacts to special-status wildlife species are described in terms of direct and indirect impacts. Direct impacts are based on the loss of suitable habitat, which may result in mortality or a reduction of breeding, feeding, or sheltering habitat; they are limited to the construction period and cannot be fully restored following construction. Indirect impacts, such as noise, motion, and startle, and any potential hydrologic modifications, such as erosion and sedimentation, are not quantified or reported for any special-status species other than vernal pool branchiopods and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), for which agency-approved mitigation guidelines have been prepared that prescribe mitigation ratios for indirect impacts on these species. For vernal pool branchiopods, direct impacts are defined as impacts within the construction footprint and indirect impacts are within a 250-foot buffer of the footprint. For the valley elderberry longhorn beetle, direct and indirect impacts are quantified as the number of elderberry shrubs (*Sambucus* sp.) within the construction footprint and a surrounding 100-foot buffer. Direct impacts on elderberry shrubs are defined as shrub removal, and indirect impacts are defined as shrub disturbance due to noise or vibration, dust and particulate matter, root exposure/compaction due to erosion and soil compaction, or changes in site hydrology (alterations in water flow patterns, inundation patterns, ground water, or water quality).

Table 2-2
Impacts on Special-Status Wildlife Species

Special-Status Species Name (Common Name [*Scientific Name*])	Listing Status (Federal/State) [a]	CWHR Vegetation Community or Wildlife Association [b]	Impact Type	Impact Acreage / Individuals
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE/—	Vernal pools/seasonal wetlands	Direct	<0.01
			Indirect	0.06
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT / --	Vernal pools/seasonal wetlands	Direct	4.43
			Indirect	26.66
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT / --	Elderberry shrubs (*Sambucus* spp.)	Direct	36 [c]
California tiger salamander (*Ambystoma californiense*)	FT / ST	Upland: ASC, AGS, PAS surrounding vernal pools/seasonal wetlands in the vicinity of Cross Creek.	Direct	18.7
		Aquatic: lacustrine habitat	Direct	18.3
Blunt-nosed leopard lizard (*Gambelia [=Crotaphytus] sila*)	FE / SE,FP	ASC, AGS, BAR, VRI	Direct	26.57
Western burrowing owl (*Athene cunicularia*)	-- / CSC	ASC, AGS, PAS, BAR, URB	Direct	2,100.90 [d]
Swainson's hawk (*Buteo swainsoni*)	-- / ST	AGS, BAR, CRP, IRH, PAS, URB, VRI	Direct	3,195.62 [e]
Nelson's (San Joaquin) antelope squirrel (*Ammospermophilus nelsoni*)	-- / ST	ASC, AGS, BAR, PAS	Direct	320.93
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	FE / SE	ASC, AGS, BAR, PAS	Direct	388.97
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE / ST	See Table 2-3		

[a] Federal Status:
FE – Endangered
FT – Threatened
State Status:
CSC – California Species of Special Concern designated by the California Department of Fish and Wildlife
FP – Fully Protected species designated by the California Department of Fish and Wildlife
SE – Endangered
ST – Threatened
[b] CWHR vegetation communities or wildlife associations defined as follows:
AGS: Annual Grassland
ASC: Alkali Desert Scrub
BAR: Barren
CRP: Cropland
IRH: Irrigated Hayfield
PAS: Pasture
URB: Urban
VRI: Valley Foothill Riparian
[c] Data presented as maximum number of identified elderberry shrubs.
[d] Represents maximum acreage of habitat where nests could occur; final impact acreages will be determined by active nests detected
[e] Represents acreage of foraging habitat within 10 miles of nests active within the last five years (2007-2011)

Table 2-2
Impacts on Special-Status Wildlife Species

Special-Status Species Name (Common Name [*Scientific Name*])	Listing Status (Federal/State) [a]	CWHR Vegetation Community or Wildlife Association [b]	Impact Type	Impact Acreage / Individuals

Notes:
Effects on all special-status wildlife species are based on the CWHR determinations of habitats and range, except as noted below:
Vernal pool tadpole shrimp and vernal pool fairy shrimp: Disturbances based on vernal pools/wetland habitat.
California tiger salamander: Potential aquatic habitat limited to natural lands in the vicinity of Cross Creek; potential upland habitat determined by identifying associated vegetation communities within a 1.24-mile radius of potential aquatic habitat. Vernal pool habitat for CTS includes “scraped unvegetated pools,” which was not included for the plant habitats listed as vernal pool.
Tipton kangaroo rat: Range limited to the San Joaquin Valley from the Kings River south based on distribution data provided by Brian Cypher, ESRP (B. Cypher 2010–2012, personal communication).
Data in this table were calculated based on the Fresno to Bakersfield Section: Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (Revised DEIR/Supplemental DEIS) (Authority and FRA 2012a); CTS data were calculated based on the Supplemental Biological Assessment (Authority and FRA October 2013)

CTS = California tiger salamander
CWHR = California Wildlife Habitat Relationship System (CWHR 1988)
ESRP = Endangered Species Recovery Program (California State University, Stanislaus).

Direct impacts on the San Joaquin kit fox (*Vulpes macrotis mutica*) include impacts on habitat linkages that could potentially function as wildlife movement corridors. A total of six linkages that intersect the project footprint and that could serve as migration and movement corridors for San Joaquin kit fox, and other wildlife species, will be directly affected at the following general locations:

- Kings River riparian corridor (Kern River Linkage).
- Cross Creek riparian corridor (St. John’s Cross Creek Linkage).
- SR 43/SR 155 area (SR 43/SR 155 Linkage).
- Allensworth area (Deer Creek–Sand Ridge Linkage).
- Poso Creek riparian corridor (Poso Creek Linkage).
- Kern River riparian corridor (Kern River Linkage).

In addition, the USFWS has identified linkage areas for the San Joaquin kit fox in the *Recovery Plan for Upland Species of the San Joaquin Valley* that connect these satellite areas to core areas in the west: the Kern River Alluvial Fan linkage, the Poso Creek linkage, the Garces Highway linkage, and the SR 43 linkage (USFWS 1998). Direct impacts on potential San Joaquin kit fox habitat, including the four USFWS-identified linkage areas, are quantified. However, offsite mitigation described in Chapter 5 will take into account direct impacts on all linkages and potential migration and movement corridors. Table 2-3 provides a summary of the impacts on the San Joaquin kit fox.

Table 2-3
Impacts on San Joaquin Kit Fox

Land Prioritization	Land Type	Impact Type	Impact Acreage [a]
Southwestern Tulare County Satellite Area	Natural	Direct	86.26
	Agricultural	Direct	578.56
Metropolitan Bakersfield Satellite Area (Urban Bakersfield)	Natural	Direct	215.99
	Urban	Direct	267.81
	Agricultural	Direct	—
Linkage Areas	Natural	Direct	20.14
	Agricultural	Direct	325.24
Remainder Areas (outside of Recovery Areas)	Natural	Direct	290.92
	Agricultural	Direct	2,709.16
		TOTAL:	4,494.08

[a] These impacts are based on the Proposed Preferred Alternative ().

Notes:

“Natural” lands include alkali desert scrub (ASC), annual grassland (AGS), barren (BAR), and pasture (PAS).

“Agricultural” lands include grain crop, deciduous orchard, row crop, hayfield, vineyard.

“Urban” lands include urban areas of metropolitan Bakersfield, including the BNSF right-of-way.

Effects on San Joaquin kit fox are based on the CWHR determinations of habitats and range.

Data in this table were calculated based on the Fresno to Bakersfield Section: Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (Revised DEIR/Supplemental DEIS) (Authority and FRA 2012a)

CWHR = California Wildlife Habitat Relationship System

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Section 3.0
Mitigation Guidelines

3.0 Resource Agency Mitigation Guidelines and Requirements

This section provides agency guidelines and requirements for compensatory mitigation and presents the proposed compensation ratios and compensation acreages for each resource.

3.1 Summary of Agency Requirements

Compensatory mitigation will be required in accordance with agency guidance to offset the environmental losses resulting from unavoidable impacts on sensitive natural resources by the Fresno to Bakersfield Section of the HST. Compensatory mitigation measures for the Fresno to Bakersfield Section are described in detail in Section 3.7, Biological Resources and Wetlands, of the *Fresno to Bakersfield Section: Revised Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement* (Authority and FRA 2012a) and the *Fresno to Bakersfield Section: Biological Assessment* (Authority and FRA 2012b). The measures are based on publically available agency guidance and protocols and industry-standard mitigation requirements and ratios determined through previous agency consultation and negotiations.

- Compensatory mitigation can be met using one or more mitigation options, as approved by regulatory agencies, including mitigation banking (existing bank credits) in-lieu fee programs, and permittee-responsible mitigation (fee-title acquisition, conservation easement). These mitigation options are described in detail in Section 5.

3.1.1 U.S. Army Corps of Engineers

USACE has published guidelines for compensatory mitigation requirements (USACE 2008a) and *Habitat and Mitigation Monitoring Proposal Guidelines* (USACE 1996). These guidelines provide general instructions for compensatory mitigation; however, final mitigation requirements are determined through consultation with the district engineer in coordination with state and federal resource agencies and may vary depending on the nature of project impacts.

Compensatory mitigation can be accomplished through restoration, enhancement, establishment, and preservation. Preferably, compensatory mitigation should follow a watershed approach. Restoration is the preferred mitigation method because it is typically most successful, has fewer upland impacts than establishment, and adds greater value in terms of aquatic resource function compared to enhancement or preservation.

In accordance with the USACE and EPA's general compensatory mitigation requirements, and as detailed under 33 Code of Federal Regulations (CFR) Part 332.3(h) (USACE and EPA 2008), preservation may be used under the following circumstances:

1) Preservation may be used to provide compensatory mitigation for activities authorized by Department of the Army permits when all the following criteria are met:

    a) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;

    b) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;

    c) Preservation is determined by the district engineer to be appropriate and practicable;

d) The resources are under threat of destruction or adverse modifications; and

e) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

2) Where preservation is used to provide compensatory mitigation, to the extent appropriate and practicable the preservation shall be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities. This requirement may be waived by the district engineer where preservation has been identified as a high priority using a watershed approach described in paragraph (c) of this section, but compensation ratios shall be higher.

In California, the State and Federal agencies that comprise the California Wetlands Monitoring Workgroup (CWMW) are promoting the use of rapid assessment methods as one of the core tools for project evaluation to inform regulatory decisions (such as Section 401 and 404 permits). The CWMW is a subcommittee of the California Water Quality Monitoring Council. CRAM is a tool for performing wetland condition assessments. Using CRAM provides a uniform approach to assessing wetland health and watershed needs and is consistent with the USACE and EPA Mitigation Rule (USACE 2008a). CRAM is considered a Level 2 approach, one of three levels of the EPA's Level 1-2-3 Framework for monitoring and assessment of wetland resources (Stein et al. 2009). The fundamental elements of this framework are as follows:

- Level 1: consists of wetland and riparian inventories and answers questions about wetland extent and distribution.
- Level 2: consists of rapid assessment, which uses cost-effective field-based diagnostic tools to assess the condition of wetland and riparian areas. Level 2 assessments answer questions about general wetland health (or condition).
- Level 3: consists of intensive assessment to provide data to validate rapid methods, characterize reference condition, and diagnose the causes of wetland condition observed in Levels 1 and 2. Level 3 assessments can be used to test hypothesis and provide insight into functions and processes. This level of CRAM will not be used in assessing project impacts or for evaluating wetlands at mitigation sites.

Generally, three methods are available for fulfilling compensatory mitigation requirements, as listed below.

- Mitigation bank credits: May be applied to mitigation requirement if permitted impacts are within the service area of an approved mitigation bank, and the bank has the appropriate number and resource type of credits.
- In-lieu fee program credits: May be applied to mitigation requirement if permitted impacts are within the service area of an approved in-lieu fee program, and the bank has the appropriate number and resource type of credits. In-lieu fees will be pursued as compensation for jurisdictional waters only if a USACE-approved in-lieu programs becomes available in the San Joaquin Valley.
- Permittee-responsible mitigation: May be applied to mitigation requirement either through onsite and in-kind mitigation or, if this is not practicable or compatible with the proposed project, offsite and/or out-of-kind mitigation may be used. Permittee-responsible mitigation must be applied when mitigation bank credits or in-lieu fee program credits cannot satisfy the mitigation requirement.

The final mitigation requirements will be determined through consultation with the district engineer in coordination with state and federal resource agencies, in accordance with the guidelines published in the *Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2012). The guidelines determine mitigation ratios through a standardized procedure that compares project impacts on proposed mitigation sites both quantitatively and qualitatively. Impacts to aquatic resources are evaluated based on their size, location, and type (or type conversion). Proposed mitigation sites are also evaluated based on their size, location, and type (or type conversion) as well as their likelihood of success and any temporal losses. Additionally, impact areas and mitigation sites are compared using functional/condition assessments (see CRAM discussion above). Numerical or categorical values are assigned to the results of these evaluations and are used to calculate the required mitigation ratio. The guidelines prefer onsite and in-kind mitigation; however, if this is not practicable or compatible with the proposed project, offsite and/or out-of-kind mitigation may be used.

For purposes of determining mitigation ratios, the impact profiles associated with the construction packages that make up portions of the Proposed Preferred Alternative will be presented to track and determine the required mitigation for each construction package. The impact profile estimates the impacts, and the amount, condition, and type of, impacts, on aquatic resources.

3.1.2 State Water Resources Control Board

The SWRCB, as directed in Resolution No. 2008-0026, is working with the CDFW to develop and implement the Wetland and Riparian Area Protection Policy (WRAPP) to conserve California's aquatic resources. The WRAPP will include regulatory guidelines for mitigating impacts on waters of the State. These guidelines are still under development and, therefore, cannot currently be applied to the project. The planned implementation of the WRAPP is outlined in the *Five Year Coordinated Work Plan for Wetlands Conservation Program Development* (CDFG and SWRCB 2011). When available, the WRAPP guidelines will be applied to the project, where feasible. It is anticipated that these guidelines will be modeled after the USACE compensatory mitigation guidelines, compensatory mitigation obligations under the SWRCB will be addressed in a manner similar to those obligations to USACE.

The scheduled implementation of the WRAPP and the objectives of each phase are described below:

- Phase 1 is in progress and was scheduled to be implemented in late 2012. It includes development of the following:
  - A wetland definition that reliably defines the diverse array of California wetlands and incorporates the USACE delineation methodology to the extent feasible; and
  - A regulatory mechanism for the discharge of dredge and fill material to all state waters, including wetlands, based on Clean Water Act Section 404 (b)(1) Guidelines (40 CFR Parts 230–233), and the federal rule on Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332; 40 CFR Part 230).
  - An assessment method for collecting water quality and wetland data to monitor progress toward water quality and wetland protection and to evaluate program development.
- Phase 2, scheduled for adoption in 2015, will expand the scope of the policy to protect wetlands from all other activities potentially affecting water quality, and include:
  - New and/or revised beneficial use definitions;
  - Water quality objectives to support those beneficial uses;

  - A program of implementation to apply the water quality objectives, as necessary, to protect all waters, including wetlands, and their water quality functions for all waste discharges (e.g., wastewater, stormwater).

- Phase 3, also schedule for adoption in 2015, will identify, protect, and promote the restoration of riparian areas and their functioning to support water quality and beneficial uses, and include:

  - A definition for riparian areas;
  - New and/or revised beneficial use definitions;
  - Water quality objectives to support those beneficial uses;
  - A program of implementation to achieve the water quality objectives to protect riparian area water quality related functions.

3.1.3 U.S. Fish and Wildlife Service

Compensatory mitigation will be provided to offset impacts on federally listed threatened and endangered species and their habitats. To compensate for direct impacts on federally listed species, USFWS will allow offsite compensation by establishing or purchasing:

- Conservation bank credits (CDFW and USFWS approved).
- In-lieu fee.
- Fee-title acquisition.
- Conservation easement.

To guide the process, the Sacramento Fish and Wildlife Office recently revised and issued a *Review Criteria for Section 7 Offsite Compensation* (dated July 28, 2011; see Appendix A). This checklist outlines the information, reports, and management needs that will need to be addressed for approval of suitable offsite compensation.

USFWS has published compensatory mitigation guidelines for a limited number of species. Of the species that have potential to be affected by the project, guidelines are only available for the valley elderberry longhorn beetle. Additionally, although specific guidelines are not available, a programmatic biological opinion was issued to address impacts on vernal pool branchiopods (USFWS 1996b) and provide recommendations for mitigation. The requirements established within these documents are summarized below.

Valley Elderberry Longhorn Beetle

Where it is not practicable to avoid shrubs with a 100-foot (or wider) buffer, elderberry shrubs that feature stems measuring 1 inch or greater in diameter at ground level must be transplanted and mitigated. All shrubs that are adversely affected must be mitigated at a ratio ranging from 1:1 to 8:1 depending on the presence or absence of exit holes and the habitat (riparian or non-riparian) in which that the shrub is found.

- Elderberry shrubs must be transplanted if they cannot be avoided by the project. All elderberry shrubs with one or more stems measuring 1 inch or greater in diameter (at ground level) will be will be transplanted to a USFWS approved conservation area during the dormancy period (November 1 to February 15). A USFWS-approved conservation area will be established that provides at least 1,800 square feet for each transplanted elderberry shrub.

- Compensatory mitigation ratios will be based on the characteristics of the various elderberry shrubs and stems removed. These characteristics include the habitat, number of stems, stem diameter at ground level, and presence or absence of exit holes. Compensatory mitigation includes both elderberry seedlings/cuttings and planting of associated native plants.

Table 3-1 summarizes the compensatory mitigation ratios identified in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999).

Table 3-1
Summary of Compensatory Mitigation Ratios for Impacts on Suitable Habitat for the Valley Elderberry Longhorn Beetle

Habitat	Stem Size Class (maximum diameter at ground level, in inches)	Exit Holes on Shrub [a]	Elderberry Seedling/ Cutting Ratio [b, c]	Associated Native Plant Ratio [b, d]
Riparian	Stems 1" to 3"	Yes	1:1	1:1
		No	2:1	2:1
	Stems 3" to 5"	Yes	2:1	1:1
		No	4:1	2:1
	Stems > 5"	Yes	3:1	1:1
		No	6:1	2:1
Non-Riparian	Stems 1" to 3"	Yes	2:1	1:1
		No	4:1	2:1
	Stems 3" to 5"	Yes	3:1	1:1
		No	6:1	2:1
	Stems > 5"	Yes	4:1	1:1
		No	8:1	2:1

[a] All stems measuring at least 1 inch in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[b] Mitigation ratios were determined following the guidelines in the U.S. Fish and Wildlife Services "*Conservation Guidelines for the Valley Elderberry Longhorn Beetle*", established in July 1999.

[c] Ratios in the *Elderberry Seedling Ratio* column correspond to the number of cuttings or seedlings to be planted per elderberry stem (at least 1 inch in diameter at ground level) affected by the proposed project.

[d] Ratios in the *Associated Native Plant Ratio* column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

Vernal Pool Branchiopods

The project's Biological Opinion (Reference: 08ESMF00-2012-F-0247) (USFWS 2013) references a 1996 programmatic biological opinion (USFWS 1996b) issued by the Sacramento Fish and Wildlife Service office. As provided in the project's Biological Opinion, impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp (*Lepidurus packardi*) will be offset by compensatory mitigation. Compensation will include both a preservation component and a creation component.

- Preservation Component: For every acre of habitat directly and indirectly affected, at least two vernal pool credits will be dedicated within a USFWS approved ecosystem preservation bank (2:1 ratio), or, based on USFWS evaluation of site-specific conservation values, 3 acres of vernal pool habitat may be preserved on the project footprint or at a non-bank site as approved by the USFWS (3:1 ratio).

- Creation Component: For every acre of habitat directly affected, at least 1 vernal pool creation credit will be dedicated within a USFWS approved habitat mitigation bank (1:1 ratio), or, based on USFWS evaluation of site-specific conservation values, 2 acres of vernal pool habitat will be created and monitored on the project footprint or at a non-bank site as approved by the USFWS (2:1 ratio).

Other Special-Status Species

Mitigation ratios for the remaining federally listed special-status species—California tiger salamander, blunt-nosed leopard lizard (*Gambelia [=Crotaphytus] sila*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox—are based on industry standards determined through previous consultation and negotiations with USFWS and CDFW, and preliminary compensatory mitigation ratios identified in Section 3.7, Biological Resources and Wetlands, of the *Fresno to Bakersfield Section: Revised Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement* (Authority and FRA 2012a).

3.1.4 California Department of Fish and Wildlife

3.1.4.1 Statutes

The California Department of Fish and Wildlife is guided by two statutes under California Fish and Game Code that are relevant to the project: the California Endangered Species Act and Lake and Streambed Alteration Agreements.

California Endangered Species Act

The California ESA (California Fish and Game Code, Section 2050 et seq.) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats by protecting all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats threatened with extinction and those experiencing a significant decline that, if not halted, would lead to a threatened or endangered designation. Animal species are listed by the CDFW as threatened, endangered, or candidate species, or fully protected, while plants are listed as rare, threatened, or endangered. However, plants listed as rare do not receive the same protections as threatened or endangered plant species. Only those plant and wildlife species listed as threatened, endangered, or candidate species receive protection under the California ESA. For projects that would result in take of a species that is state-listed or a candidate for listing, the project sponsor must obtain authorization from the CDFW to "take" the species incidental to otherwise lawful activities. Generally, the CDFW requires project proponents to apply for a take permit in accordance with California Fish and Game Code, Section 2081(b).

Lake and Streambed Alteration

Lake and Streambed Alteration (California Fish and Game Code, Section 1600 et seq.) requires notifying the CDFW prior to any project activity that would do any of the following:

- Substantially divert or obstruct the natural flow of any river, stream, or lake.
- Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake.
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken in the flood plain of a body of water. Preliminary notification and project review generally occur during the environmental process.

When an existing fish or wildlife resource may be substantially adversely affected, the CDFW is required to propose reasonable modifications to the project to protect the resources. These modifications, or conditions, are formalized in a Lake or Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

3.1.4.2 Agency Guidelines

Compensatory mitigation may be required for impacts on two types of resources under CDFW jurisdiction: state-listed species protected under the California ESA (California Fish and Game Code, Sections 2050 et seq.) and riparian areas protected under the Lake and Streambed Alteration (California Fish and Game Code, Section 1600 et seq.). No compensatory mitigation guidelines for mitigation requirements are prescribed under the California ESA; however, guidance provided by CDFW representatives is presented below. CDFW is currently working with the SWRCB to produce regulatory guidelines for mitigation of riparian areas as a part of the WRAPP (as described in Section 3.1.2); however, these guidelines are not yet available.

To compensate for impacts on state-listed species, CDFW accepts the following methods of mitigation, in order from most to least desirable:

- Conservation bank credits (CDFW approved).
- Fee-title acquisition.
- Conservation easement.
- Existing USFWS-approved conservation bank (banking instrument would need to be opened and revised).

In general, as with USFWS and in contrast to USACE, CDFW prioritizes preservation of existing habitat rather than habitat creation.

CDFW has published compensatory mitigation guidelines for several listed species. Of the species that have potential to be affected by the proposed project, guidelines are available for two species, Swainson's hawk (*Buteo swainsoni*) and burrowing owl. Mitigation guidelines for these species are summarized below.

Swainson's Hawk

In accordance with the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California* (CDFG 1994), "project specific measures may be developed" and submitted to CDFW for review. Swainson's hawk mitigation strategies are currently being developed by URS/HMM/Arup Joint Venture biologists in coordination with CDFW.

Burrowing Owl

In accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012), the project should mitigate for permanent impacts on nesting, occupied, and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of burrows and burrowing owls impacted are replaced in accordance with their life history, habitat requirements, and known threats. While no ratio of habitat replacement is provided, the ratios presented in the earlier 1995 *Staff Report on Burrowing Owl Mitigation* (CDFG 1995) may be used as a starting point for determining mitigation ratios. However, these ratios should not be used as a default and should be adjusted depending on the nature of impacts and proposed mitigation. Proposed mitigation ratios would be submitted to CDFW for review.

For reference, the recommended mitigation ratio for burrowing owl is 6.5:1 (6.5 acres of foraging habitat per pair or unpaired resident bird affected) (CDFG 1995). If the destruction of occupied burrows is unavoidable, compensatory mitigation by enhancing existing unsuitable burrows or

creating new burrows at a 2:1 ratio (two burrows enhanced or created for every occupied burrow destroyed) on a protected land site is recommended. Burrow enhancement includes enlarging or clearing burrows of debris. New burrows would be created by installing artificial burrows.

Other Special-Status Species

Proposed mitigation ratios for the remaining state-listed special-status species—California tiger salamander, blunt-nosed leopard lizard, Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat, and San Joaquin kit fox, listed in Table 4-1 below, are based on industry standards determined through previous consultation and negotiations with USFWS and CDFW.

Section 4.0
Compensatory Mitigation Strategy

4.0 Overall Compensatory Mitigation Strategy

4.1 Proposed Compensation Ratios and Acreages

This section presents proposed compensation ratios and the corresponding acres of proposed mitigation for impacted resources, including jurisdictional waters and special-status wildlife species.

In case impacts and offsite compensation acreages for a given resource cannot be determined until protocol and/or preconstruction surveys have been performed (e.g., valley elderberry longhorn beetle [based on elderberry shrubs/stem size class], Swainson's hawk [based on active nest trees], western burrowing owl (*Athene cunicularia*) [based on active burrows]); final compensation acreages will be sought in accordance with agency guidelines after actual impacts on resources have been identified.

4.1.1 Jurisdictional Waters

Through coordination with USACE and EPA on August 15, 2012, regarding the CRAM and Wetland Evaluation Report prepared on behalf of the Checkpoint C process, it was agreed that mitigation could be pursued at the Tulare–Buena Vista Lakes HUC 6 (180300) watershed level.

As described in the September 14, 2012, technical memorandum, *Review of Vernal Pool Preservation vs. Creation in the San Joaquin Valley's Tulare Lake Basin Watershed* (URS/HMM/Arup Joint Venture 2012a), vernal pool preservation has been identified as a high priority for the Tulare Lake Basin because of threats and limitations that further distinguish these particular vernal pools in the Tulare Lake Basin from those located elsewhere in the San Joaquin Valley. These include the fragile nature of natural vernal pool landscapes (appropriate soils, vegetation, and hydrology); past and future agricultural and urban development; reduction of threatened or endangered plant and wildlife species, especially those adapted to vernal pool habitats; the regional uniqueness of the vernal pool subset type, alkali rain pool, found in the Tulare Lake Basin; the scarcity of degraded vernal pool landscapes suitable for restoration or enhancement; and the significant difficulties, risk, and uncertainty involved in establishing (creating) vernal pools that meet regulatory agency performance standards.

Because the majority of the land in the Central Valley has been converted to agricultural uses and the natural areas that remain are widely disturbed and fragmented, preservation of remaining natural vernal pool landscapes is extremely important to the preservation of biological resources in the Tulare Lake Basin. Preservation of vernal pool habitat as part of the vernal pool landscape in the Tulare Lake Basin is a critical component of the natural resource agency, natural land manager, and regional conservation groups' goals of minimizing or reversing the effects of habitat fragmentation in the Central Valley. Success at doing so would increase natural habitat connectivity, provide for wildlife movement on a micro and macro scale, reduce edge effects, provide natural buffers to aquatic resources and natural habitats, and increase the viability of native and special-status plant and wildlife species and local populations.

To demonstrate that the Fresno to Bakersfield Section of the HST meets the criteria outlined under 33 CFR Part 332.3(h) (USACE and EPA 2008), Project biologists performed a review of vernal pool preservation and creation in the San Joaquin Valley's Tulare Lake Basin Watershed, including reading published literature and reports, contacting experienced individuals, and analyzing historical and contemporary vernal pool distribution data. These criteria are addressed individually below.

(1i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed.

Within the Tulare Lake Basin, CDFW has identified one vernal pool region: the San Joaquin Valley Vernal Pool Region, which encompasses the low-lying San Joaquin Valley below 500 feet in elevation. The San Joaquin Valley Vernal Pool Region includes portions of Fresno, Kings, Tulare, and Kern counties where mitigation planning efforts have been focused for the Fresno to Bakersfield Section of the HST. Compared to other vernal pool regions, the San Joaquin Valley Vernal Pool Region is composed of "a more extensive development of alkaline claypan pools, well-developed transition of these pools to extensive alkaline wetlands, and lower average annual precipitation" (Keeler-Wolf et al. 1998). The composition of these northern claypan pools varies from small mima mounds to larger alkali pools to playa-like alkali wetlands and valley sink scrub. CDFW has identified several threats to pools in this region, including agriculture and urban development (drip irrigation in particular has been a factor in the conversion of vernal pool habitat to vineyards and orchards) and acknowledges that these threats have "obliterated restoration opportunities for northern claypan pools" (Keeler-Wolf et al. 1998).

As a whole, vernal pools are the product of a unique combination of soil conditions, Mediterranean climate, topography and hydrology, and specialized biota that exist in a fragile state. Although once widespread, vernal pools have since experienced a dramatic decline in California's Central Valley, from a roughly estimated 4,000,000 acres (of vernal pool "landscapes") in pre-agricultural time to below 1,000,000 acres in contemporary time (Holland 2009). Despite the unique characteristics of vernal pools, they support a high diversity of plant and wildlife species and are one of the few California habitats still dominated by native species. Among the species found in vernal pools are many that are state and federally listed. Throughout the San Joaquin Valley Vernal Pool Region (which extends beyond the Tulare Lake Basin), CDFW reports 19 sensitive plant species and 9 sensitive wildlife species, including the vernal pool tadpole shrimp, vernal pool fairy shrimp, and California tiger salamander, all of which may be present within the Tulare Lake Basin (Keeler-Wolf et al. 1998).

Generally speaking, undisturbed vernal pools and vernal pool landscapes retain their natural physical structure and exhibit natural or near-natural hydrology. They also provide important buffers to aquatic resources, contribute to water table recharge, improve water quality, and show considerable biological value by providing habitat for migratory and resident waterfowl as well as multiple sensitive plant and wildlife species. In addition, due to their sensitivity to environmental conditions, vernal pools may act as an indicator system of how climate change affects Mediterranean climates.

More recently, alkali rain pools, a little recognized subset of vernal pools found in the Southern San Joaquin Valley, have been described. Alkaline rain pools were first discussed in the literature by Robert Preston as being a subcategory of vernal pools due to their distinguishable vegetation community, soils with high alkalinity (alkaline/saline soils), and arid hydrology (Preston 2010). Alkaline rain pools are depressions that are found in environments with alkaline/saline soils. Alkaline/saline soils in arid climates may form under three conditions: (1) there must be a source of water; (2) there must be a source of ions or dissolvable minerals that can be translocated by water; and (3) there must be a process of solution concentration (i.e., evapotranspiration exceeds precipitation (Boettinger 1997). For alkali rain pools to form within this environment, there must also be (4) slight depressions in the landscape. Depressions serve the dual purpose of preventing dissolved salts from being able to leach out of the soil (i.e., they act as a closed system) and serve as a collecting area for soluble salts which have leached out of adjacent topographically raised areas. In effect, the depressions act as mini-playas, which allow salts to accumulate once water evaporates.

(1ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available.

Vernal pools and swales, and the subset of alkali rain pools, occur in scattered locations throughout the Tulare Lake Basin in natural areas where agricultural and urban development have not yet encroached upon and permanently altered the vernal pool landscape. In the Tulare Lake Basin, vernal pools are predominantly associated with the alkali desert scrub plant community. Alkali desert scrub vegetation is typically dominated by shrublands with understory cover of herbs and forbs and by vernally inundated or saturated areas lacking a shrub layer (vernal pools). These latter areas are characterized by herbs and forbs interspersed with barren, vernally inundated, or saturated alkali patches. Primary plant species observed during the various surveys included spinescale saltbush (*Atriplex spinifera*), cattle saltbush (*Atriplex polycarpa*), iodine bush (*Allenrolfea occidentalis*), goldenbush (*Isocoma acradenia*), and bush seepweed (*Suaeda moquinii*).

Alkali desert scrub supports a wide variety of wildlife species, including special-status species such as the blunt-nosed leopard lizard (*Gambelia sila*), the San Joaquin kit fox, the Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and coast horned lizards (*Phrynosoma blainvillii*). Many wildlife species found in this habitat type are burrowers or burrow-dependent species, such as the western burrowing owl, western spadefoot toad (*Spea hammondii*), American badger, foxes (*Vulpes* sp.), coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), and a variety of kangaroo rats (*Dipodomys* spp.).

Given the sensitivity of vernal pool resources to disturbance and the rate of loss in the Tulare Lake Basin and the greater Central Valley, the preservation of vernal pool habitat is critical to the ecological sustainability of vernal pool landscapes and the native and special-status plant and wildlife species they sustain. The existing mosaic of vernal pool habitat that remains today roughly corresponds to the geography of existing natural land types in the Tulare Lake Basin. These natural lands have been used as the baseline for identifying critical wildlife movement corridors that provide connectivity across the Central Valley floor, along riparian corridors, and between existing protected lands. These protected lands include the Allensworth Ecological Reserve, composed of 5,056 acres of fragmented parcels supporting alkali desert scrub and vernal pool habitat; Pixley National Wildlife Refuge, composed of 6,389 acres of grasslands, vernal pools, and playas; Kern National Wildlife Refuge, composed of 11,249 acres of seasonal wetlands, riparian habitat, valley grasslands, alkali playa, and valley sink scrub habitats; Colonel Allensworth State Historic Park, composed of remnant alkali desert scrub habitat; Atwell Island, composed of 7,000 acres of retired agricultural land under restoration to native valley grasslands, wetlands, and alkali sink habitats; and the Northern Semitropic Ridge Ecological Reserve (CDFW) and Semitropic Ridge Preserve (Center for Natural Lands Management), composed of 10,382 acres and 3,700 acres, respectively, of alkali desert scrub, open grasslands, and alkali playas and scalds. Cumulatively, these natural lands vary in size and are highly fragmented in distribution, scattered across the Tulare Lake Basin and interspersed with agricultural and urban development.

Protecting natural lands in these areas, and retiring and restoring disturbed lands may minimize or reverse the effects of habitat fragmentation in the Central Valley. Success at these efforts would increase natural habitat connectivity, provide for wildlife movement on a micro and macro scale, reduce edge effects, provide natural buffers to aquatic resources and natural habitats, and increase the viability of native and special-status plant and wildlife species.

(1iii) Preservation is determined by the district engineer to be appropriate and practicable.

Wetland practitioners and land managers at the Bureau of Land Management, Wildlands Inc., and Westervelt Ecological Services involved with wetland restoration, enhancement, establishment, and preservation were contacted to determine anecdotally whether a precedent has been set for alkaline vernal pool creation in the Tulare Lake Basin and whether vernal pool preservation is appropriate and practicable in the Tulare Lake Basin.

At the Atwell Island Land Retirement Demonstration Project, the Bureau of Land Management is currently undertaking the restoration of 7,000 acres of retired agricultural land to native valley grasslands, wetlands, and alkali sink habitats. Fairy shrimp species are known to occur and have been collected at various undetermined locations within the boundaries of the project. The project restoration plan did not include vernal pools or vernal pool landscapes among its restoration objectives. However, a small number of depressions were scoured after restoration efforts had begun in an attempt to develop vernal pools. These depressions were seeded with a mix that included Ferris' goldfields *(Lasthenia ferrisia)*, Mojave seablite *(Sueada moquinii)*, and Parry's Mallow (*Eremalche parryi*). These seedings were successful in the first 2 years, but nothing germinated in 2012 due to lack of rain. No formal monitoring has been performed at these locations to determine whether vernal pool plants or fairy shrimp are present, whether the necessary wetland indicators are present, or whether typical vernal pool wetland performance standards have been, or could be, met. Similarly, water collects in depressions that were inadvertently created during earth-moving activities during the construction of artificial burrows for San Joaquin kit fox and western burrowing owl. At present, none of the depressions described above would meet the performance standards expected of a vernal pool (i.e., soils, hydrology, plant/wildlife species); instead, they more closely resemble instances where water would naturally collect in a depression or tire rut, but could develop into vernal pools over time (Denis Kearns 2012, personal communication).

According to Richard Moss of Wildlands Inc., the availability of restorable vernal pool landscapes in the Tulare Lake Basin is limited and has not been attempted to date due to lack of market demand. Most of the vernal pool projects in this region consist of habitat restoration of lands under management as irrigated pasture and other light agricultural uses, where typical vernal pool restoration consists of amending and recontouring the soil above the clay lens, thereby working with the existing impervious layers. Lands managed under more intensive agriculture practices such as deep ripping would require massive earthworks to rebuild an impervious layer. Given the fragile nature of a natural vernal pool landscape, such large-scale earthworks provide little guarantee of meeting any performance standard without introducing artificial hydrology. To Richard’s knowledge, no one has attempted vernal pool restoration or creation in this region without an existing clay layer (Richard Moss 2012, personal communication).

Greg Sutter and Travis Hemmen of Westervelt Ecological Services concur that vernal pool restoration in the Tulare Lake Basin has not been attempted due to lack of market demand. Their experience indicates that the availability of restorable vernal pool landscapes is limited by the availability of intact, unaltered claypan/hardpan layers and the “right” heavy clay soils, adequate acreage to provide a buffer within the landscape (vernal pool density), and the region’s flashy precipitation levels. Regional precipitation levels in the southern San Joaquin Valley are such that vernal pools may be dry 7 out of every 10 years. Much of the land in the southern San Joaquin Valley has been altered through deep-ripping to a point where reestablishment is not feasible. The availability of unaltered natural lands for mitigation purposes is further handicapped by the number of willing sellers and land-use restrictions like surface control (mineral rights) identified during the title review process. Together, these limitations make it difficult to find sizeable properties where the claypan/hardpan layers and soils are unaltered, with willing sellers and no surface control restrictions.

These issues are further compounded by the difficulties associated with standard agency performance standards, which may be hard to achieve in the Tulare Lake Basin under the conditions described above. The performance standards for grassland vernal pool restoration, enhancement, or establishment in the Sacramento Valley, for example, may not be appropriate for the same activities for alkaline vernal pools in the Tulare Lake Basin. All told, significant challenges will be associated with finding suitable mitigation properties where vernal pool restoration, enhancement, or establishment is feasible in the Tulare Lake Basin (Sutter and Hemmen 2012, personal communication).

The general consensus among those wetland practitioners and land managers in the San Joaquin Valley contacted for this review is that vernal pool creation has, for all intents and purposes, not been attempted intentionally in the Tulare Lake Basin due primarily to the lack of market demand. Based on observations by Mr. Kearns with BLM, vernal pool creation could be tried successfully. Where suitable degraded or minimally altered vernal pool landscapes are identified, vernal pool creation should be attempted with performance standards and adaptive management techniques in place carefully tailored to the region to mitigate for risk of failure, given the lack of existing data on successful vernal pool creation attempts in the San Joaquin Valley.

(1iv) The resources are under threat of destruction or adverse modifications.

In 1998, CDFW and vernal pool expert Robert F. Holland completed a cartographic analysis of the Central Valley and reported the loss of approximately 75% of vernal pool habitat (vernal pool “landscapes” or “communities”) in California. Within the 22 counties where habitat loss was considerable (including Fresno, Kings, Tulare, and Kern counties), habitat losses averaged 384 acres per year (unevenly distributed) (Holland 1998). Revisiting this cartographic analysis in 2005, Holland documented a further reduction of vernal habitat totaling roughly 135,000 acres; 81% of this recent habitat loss was attributed to agricultural land conversions (Holland 2009).

During the development of potential mitigation opportunities for the HST project, the threat of destruction or adverse modifications to vernal pools was documented to be in progress. In August 2012, the CDFW notified the Authority about a pending law enforcement action within the boundaries of one of the permittee-responsible mitigation properties under investigation for wildlife conservation and wetlands mitigation (vernal pool preservation). The law enforcement action involved discing an estimated 2.5 to 5 acres of alkali desert scrub habitat where depressional wetlands have been mapped (Ferranti 2012, personal communication). The extent of wetland habitat loss has not yet been determined.

In the vicinity of the Yang and Staffel properties (see Section 5.4.2), for example, the surrounding properties are composed of recently planted deciduous orchards, irrigated hayfields, and vineyards that still show trace signatures of alkali soils in the aerial imagery, indicating the loss of natural alkali desert scrub habitats where vernal pool complexes were once more prevalent.

Certain properties under consideration are also under consideration for agricultural land use in the near future. At present, landowners of the Buena Vista Dairy, Old River Dairy, and River Ranch properties have been approached by third parties interested in purchasing or leasing their land to farm nut (i.e., pistachio) trees or other crop types or are independently considering farming or selling the land for business purposes. These three properties provide a mix of alkaline rain pool, seasonal wetland, and riverine/riparian preservation, establishment, reestablishment, and enhancement opportunities.

Today, intact vernal pools within the Tulare Lake Basin’s historical vernal pool landscape are highly fragmented and widely dispersed between the Allensworth Ecological Reserve, Pixley National Wildlife Refuge, Kern National Wildlife Refuge, Colonel Allensworth State Historic Park,

Atwell Island, Northern Semitropic Ridge Ecological Reserve, and Semitropic Ridge Preserve, and other isolated natural areas located on unprotected, private lands. Agricultural and urban development continue to encroach on remaining natural habitats, further fragmenting and isolating the vernal pool landscape into smaller vernal pool complexes or individual pools. Habitat fragmentation leads to decreased habitat connectivity, impaired wildlife movement on a micro and macro scale, increased edge effects, loss of natural buffers to aquatic resources and natural habitats, and reduced viability of native and special-status plant and wildlife species and local populations.

(1v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

As described herein, the Authority/FRA will provide assurances that preserved sites will be permanently protected. That protection will be gained by means of an appropriate real estate or other legal instrument such as establishment of a conservation easement or fee-title acquisition of the property with an endowment to fund the long-term management of the land and transfer of the property to an approved third-party holder (land trust, non-governmental organization, etc.).

(2) Where preservation is used to provide compensatory mitigation, to the extent appropriate and practicable the preservation shall be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities. This requirement may be waived by the district engineer where preservation has been identified as a high priority using a watershed approach described in paragraph (c) of this section, but compensation ratios shall be higher.

As described herein, permittee-responsible mitigation properties were identified through a mitigation site selection analysis. This consisted of a Geographic Information System (GIS) and visual analyses of the entire San Joaquin Valley floor, generally from Fresno to Bakersfield and inclusive of Fresno, Kings, Tulare, and Kern counties. Aquatic and wildlife resource mitigation sites were identified by selecting land parcels that appeared to retain natural habitat and/or jurisdictional water features for analysis. For aquatic resources in particular, sites were targeted that feature existing wetlands and were candidates for wetland restoration, enhancement, and establishment.

Twelve permittee-responsible mitigation properties (~7,218 ac) have been identified as optimal for permittee-responsible mitigation and constitute the permittee-responsible mitigation options currently under investigation. These mitigation options include restoration, enhancement, and establishment in conjunction with the proposed preservation component of the proposed compensatory mitigation.

As described in criteria (1i) through (2) above, vernal pool preservation has been identified as a high priority for the Tulare Lake Basin because of threats and limitations. These include the fragile nature of natural vernal pool landscapes (appropriate soils, vegetation, and hydrology); past and future agricultural and urban development; reduction of threatened or endangered plant and wildlife species, especially those adapted to vernal pool habitats; the scarcity of degraded vernal pool landscapes suitable for restoration or enhancement; and the significant difficulties, risk, and uncertainty involved in establishing (creating) vernal pools that meet regulatory agency performance standards.

Because the majority of the land in the Central Valley has been converted to agricultural uses and the natural areas that remain are widely disturbed and fragmented, preservation of remaining natural vernal pool landscapes is extremely important to the preservation of biological

resources in the Tulare Lake Basin. Preservation of vernal pool habitat as part of the vernal pool landscape in the Tulare Lake Basin would increase natural habitat connectivity, provide for wildlife movement on a micro and macro scale, reduce edge effects, provide natural buffers to aquatic resources and natural habitats, and increase the viability of native and special-status plant and wildlife species and local populations.

Through consultation with wetland practitioners and land managers in the San Joaquin Valley, where suitable degraded or minimally altered vernal pool landscapes are identified, vernal pool creation could be tried successfully. It is important that vernal pool creation should be attempted with performance standards and adaptive management techniques in place that are carefully tailored to the region. An investigation is currently under way to determine whether alkaline rain pool creation might be feasible at the Old River Dairy property. Old River Dairy is currently under cultivation; it adjoins the undisturbed Buena Vista Dairy property where alkali desert scrub and alkaline rain pools persist. Through a combination of aerial photography, soil and water sampling, and historical analysis, this investigation will review the existing physical conditions (e.g., soil chemistry, water table, rainfall) to determine if corrective measures can be taken to restore Old River Dairy to historical conditions.

For these reasons, vernal pool preservation has been proposed as compensatory mitigation in conjunction with aquatic resource restoration, establishment, and/or enhancement activities to the extent appropriate and practicable to meet the national “no net loss” policy.

CRAM data can be utilized for determining which assessment areas could benefit from restoration or enhancement. CRAM data will also be key in determining the appropriate amounts of compensatory mitigation that are provided to replace or compensate for the loss of wetlands or natural habitat areas, e.g., an impact on a wetland feature with a high CRAM score would require a higher mitigation ratio to compensate for unavoidable impacts on the wetland feature.

Furthermore, CRAM will be used to inform the mitigation planning decisions including site selection; the ecological lift, or benefits, of mitigation; and mitigation ratios.

Because CRAM assessment of jurisdictional waters has not been completed and formal consultation with USACE through the *Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2012) has not been initiated for the mitigation sites, mitigation obligations to ensure no-net-loss of aquatic functions or services are not currently known. For planning purposes, mitigation ratios of 1:1 to 3:1 could be applied to Table 2-1a and 2-1b, above, to assist in the preliminary identification of mitigation obligations for jurisdictional waters. However, the final mitigation ratios will be determined on a site-by-site basis, as determined through consultation with the USACE through a level 2 watershed approach that would identify the ecological lift associated with a given mitigation site and mitigation activity.

4.1.2 Special-Status Wildlife Species

Based on the available agency guidance and protocols, and industry-standard mitigation requirements and ratios determined through previous consultation and negotiations with USFWS and CDFW, the mitigation ratios listed in Table 4-1 are proposed to offset impacts on state- and federally listed wildlife species.

Table 4-1
Proposed Mitigation for Impacts on State- and Federally Listed Wildlife Species in CP1

State- and Federally Listed Species Name (Common Name/Scientific Name)	Impact Type	Impact Acreage / Individual [a]	Proposed Compensation Ratio	Proposed Mitigation Acreage [a]
Construction Package 1c				
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Direct	<0.01	3:1	0.01
	Indirect	0.06	1.1:1	0.07
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Direct	--	3:1	--
	Indirect	0.10	1.1:1	0.11
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Direct (elderberry shrubs)	--	1:1 – 8:1 and 1,800 sq ft/plant	--
California tiger salamander *(Ambystoma californiense)*	Direct (Upland)	--	3:1	--
	Direct (Aquatic)	--	0.1:1 – 1:1	--
Blunt-nosed leopard lizard (*Gambelia* [=Crotaphytus] *sila*)	Direct	--	4:1	--
Swainson's hawk (*Buteo swainsoni*)	Active nests w/in 0.5 mile	TBD[c]	150 ac per nest tree	TBD[c]
Western burrowing owl (*Athene cunicularia*)	Direct (burrow)	TBD[c]	6.5 ac per individual/pair	TBD[c]
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	Direct	--	TBD	--
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	Direct	--	3:1	--
San Joaquin kit fox (*Vulpes macrotis*)	Direct	47.87	see Table 4-2	35.24
Construction Package 2/3				
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Direct	--	3:1	--
	Indirect	--	1.1:1	--
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Direct	4.43	3:1	13.30
	Indirect	26.66	1.1:1	29.32
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Direct (elderberry shrubs)	~36 plants	1:1 – 8:1 and 1,800 sq ft/plant	TBD[b]
California tiger salamander *(Ambystoma californiense)*	Direct (Upland)	16.82	3:1	--
	Direct (Aquatic)	20.56	0.1:1 – 1:1	--
Blunt-nosed leopard lizard (*Gambelia* [=Crotaphytus] *sila*)	Direct	23.87	4:1	95.48
Swainson's hawk (*Buteo swainsoni*)	Active nests w/in 0.5 mile	TBD[c]	150 ac per nest tree	TBD[c]
Western burrowing owl (*Athene cunicularia*)	Direct (burrow)	TBD[c]	6.5 ac per individual/pair	TBD[c]
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	Direct	50.53	TBD	TBD

Table 4-1
Proposed Mitigation for Impacts on State- and Federally Listed Wildlife Species in CP1

State- and Federally Listed Species Name (Common Name/Scientific Name)	Impact Type	Impact Acreage / Individual [a]	Proposed Compensation Ratio	Proposed Mitigation Acreage [a]
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	Direct	150.94	3:1	452.82
San Joaquin kit fox (*Vulpes macrotis*)	Direct	3,060.72	see Table 4-2	1,490.58
Construction Package 4 (7th Standard)				
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Direct	--	3:1	--
	Indirect	--	1.1:1	--
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Direct	--	3:1	--
	Indirect	--	1.1:1	--
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Direct (elderberry shrubs)	--	1:1 – 8:1 and 1,800 sq ft/plant	--
California tiger salamander *(Ambystoma californiense)*	Direct (Upland)	--	3:1	--
	Direct (Aquatic)	--	0.1:1 – 1:1	--
Blunt-nosed leopard lizard (*Gambelia* [=Crotaphytus] *sila*)	Direct	12.54	4:1	50.16
Swainson's hawk (*Buteo swainsoni*)	Active nests w/in 0.5 mile	TBD[c]	150 ac per nest tree	TBD[c]
Western burrowing owl (*Athene cunicularia*)	Direct (burrow)	TBD[c]	6.5 ac per individual/pair	TBD[c]
Nelson's antelope squirrel (*Ammospermophilus nelsoni*)	Direct	27.84	TBD	TBD
Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)	Direct	27.84	3:1	83.52
San Joaquin kit fox (*Vulpes macrotis*)	Direct	1,477.46	see Table 4-2	363.26

[a] Data in this table were calculated based on the Fresno to Bakersfield Section: Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (Revised DEIR/Supplemental DEIS) (Authority and FRA 2012fa); CTS data were calculated based on the Supplemental Biological Assessment (In preparation, 2013)

[b] Final mitigation numbers will be determined based on shrub/stem counts of impacted plants.

[c] Final mitigation acreages will be determined by active nests detected during preconstruction surveys.

ac = acre
sq ft = square foot
TBD = to be determined
w/in = within

Table 4-2 lists the proposed mitigation for impacts on the San Joaquin kit fox.

Table 4-2
Proposed Mitigation for Impacts on the San Joaquin Kit Fox by Construction Package

Impact Area – Wildlife Community Type	Land Type	Maximum Impact Acreage	Proposed Compensation Ratio	Proposed Mitigation Acreage
Construction Package 1c				
Southwestern Tulare County Satellite Area	Natural	--	3:1	--
	Agricultural	--	0.5:1	--
Metropolitan Bakersfield Satellite Area	Natural	--	3:1	--
	Urban	--	0.1:1	--
	Agricultural	--	0.5:1	--
Linkage	Natural	--	3:1	--
	Agricultural	--	0.5:1	--
Outside of Recovery Areas	Natural	16.03	2:1	32.06
	Agricultural	31.84	0.1:1	3.18
	TOTAL:	**47.87**		**35.24**
Construction Package 2/3				
Southwestern Tulare County Satellite Area	Natural	97.94	3:1	293.82
	Agricultural	618.78	0.5:1	309.39
Metropolitan Bakersfield Satellite Area	Natural	--	3:1	--
	Urban	--	0.1:1	--
	Agricultural	--	0.5:1	--
Linkage	Natural	--	3:1	--
	Agricultural	--	0.5:1	--
Outside of Recovery Areas	Natural	343.67	2:1	687.34
	Agricultural	2,000.33	0.1:1	200.03
	TOTAL:	**3,060.72**		**1,490.58**
Construction Package 4				
Southwestern Tulare County Satellite Area	Natural	2.72	3:1	8.16
	Agricultural	12.14	0.5:1	6.07
Metropolitan Bakersfield Satellite Area	Natural	--	3:1	--
	Urban	--	0.1:1	--
	Agricultural	--	0.5:1	--
Linkage	Natural	12.30	3:1	36.90
	Agricultural	356.80	0.5:1	178.40
Outside of Recovery Areas	Natural	12.83	2:1	25.66
	Agricultural	1,080.67	0.1:1	108.07
	TOTAL:	**1,477.46**		**363.26**
				1,889.08

Section 5.0

Proposed Mitigation

5.0 Proposed Mitigation

This section describes the proposed mitigation based on the mitigation strategy presented in Section 4.0 through mitigation/conservation banks, in-lieu fee programs, and permittee-responsible mitigation. Additionally, this section presents the recommended mitigation options by resource. The following sections outline the potential mitigation options available; the final compensatory mitigation plan and permit submittals will identify the appropriate resource-specific mitigation option(s) and the rationale for their selection.

5.1 Mitigation/Conservation Banks

A conservation or mitigation bank is privately or publicly owned land that is permanently protected through a conservation easement or similar deed restriction designed to protect the targeted resources. The bank owner sells habitat or species credits to third parties, who use credits for mitigation purposes. A mitigation bank provides credits for wetland restoration, creation, and enhancement, to mitigate for impacts on jurisdictional waters. A conservation bank generally protects special-status species habitat and credits are established for the specific species that occur on the site.

According to USACE, USFWS, and CDFW guidelines, mitigation bank credits are the preferred method for fulfilling compensatory mitigation requirements. If possible, compensatory mitigation through the purchase of bank credits may be used to satisfy the mitigation requirements for the project before applying other mitigation options. To fulfill mitigation requirements using mitigation bank credits, one or more banks must be identified that meet the following criteria:

- The bank's service area overlaps with project impacts.
- The bank has credits for the resource types required.
- The bank has an approved instrument.

The time frame necessary to fulfill compensatory mitigation requirements through mitigation/conservation banks would depend on such factors as the availability of existing banks; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management plan, and adaptive management plan; and agency coordination and approval of existing banking options. Thus, this time frame could vary, ranging from as few as several weeks or months for the purchase of established mitigation/conservation bank credits to as many as several months or years to develop and approve a mitigation/conservation bank.

5.1.1 Jurisdictional Waters

Currently, there are no USACE-approved mitigation banks that meet the criteria identified above. If a mitigation bank becomes available, a mitigation plan must be submitted to USACE. The plan must describe the ecological baseline conditions at the impact site and explain how the available number of credits of particular resource types will mitigate for project impacts. If USACE approves the mitigation plan, credits could be purchased from the bank operator.

5.1.2 Plant Species

Impacts to plant species are only anticipated if plants under USFWS or CDFW jurisdiction are found during pre-construction surveys in areas where potential suitable habitat has been identified but no surveys were performed. Therefore, the anticipated need for mitigation is low. If mitigation is required, conservation bank credits are generally the preferred method for fulfilling compensatory mitigation requirements for impacts on plant species. If all mitigation needs cannot be met through conservation bank credits, a plant re-establishment program will be combined,

where possible, with any of the other mitigation options for biological resources presented in this section.

5.1.3 Wildlife Species

Both USFWS and CDFW will require compensatory mitigation for impacts on listed species under their jurisdiction; therefore, it is necessary that a bank has an instrument that is approved by one or both of the agencies. Banks that are approved by both agencies are preferred.

5.2 In-Lieu Fee Programs

In a combined statement issued in the Federal Register (FR) on November 7, 2000 (65 FR 66915), the USACE, Environmental Protection Agency, and USFWS stated guidelines for the use of in-lieu fees for compensatory mitigation. An in-lieu-fee program is a compensatory mitigation option whereby, instead of either completing project-specific mitigation or purchasing credits from an approved mitigation bank, the permittee instead provides funds to an in-lieu-fee sponsor who may use the funds pooled from multiple permittees to create mitigation site(s) to satisfy the permittees' required mitigation. In-lieu fees may be used to compensate for impacts authorized by individual permit if the in-lieu fee arrangement is developed, reviewed, and approved using the process established for mitigation banks in the November 28, 1995 *Federal Guidance on the Establishment, Use and Operation of Mitigation Banks*. In general, in-lieu-fee mitigation should only be used to compensate for impacts on jurisdictional waters authorized by a Section 404 general permit when onsite mitigation or mitigation banks are not available or when a mitigation bank does not provide "in-kind" mitigation or wetland restoration, creation, or enhancement. For wildlife species, in-lieu fee programs are an acceptable form of mitigation through USFWS. The Authority would work with CDFW to satisfy the Section 2081 permitting standards to fully mitigate for impacts to the species resulting from the take-causing activities.

An in-lieu fee program should:

- Be administered by a qualified organization.
- Identify the resources present and supply the necessary information to agencies in a timely manner.
- Work within a watershed planning effort.
- Give careful consideration to site selection, including the ecological and aquatic suitability of the site.
- Include consideration of technical feasibility; the site should be self-sustaining to the extent possible.
- Describe the role of preservation.
- Ensure collection of funds and ensure that contingency measures are made.
- Plan for continued monitoring and management of the mitigation site.

At this time, no in-lieu fee mitigation programs are available for the HST project to compensate for impacts on jurisdictional waters. The Authority will continue to work with the USACE to determine if an in-lieu fee program is available and appropriate.

5.3 Permittee-Responsible Mitigation

Permittee-responsible mitigation refers to the outright purchase (fee-title acquisition) of property or an easement agreement placed on lands for compensatory mitigation (conservation easement). To be approved for permittee-responsible mitigation, suitable mitigation lands must be identified and specific funding assurances must be in place. Permittee-responsible mitigation provides the opportunity to protect those properties that most closely replace the habitats

affected by project impacts. For a project of this scale, mitigating for impacts with a few, large properties increases the ecological value of the mitigation site.

5.3.1 Jurisdictional Waters

For permittee-responsible mitigation, mitigation lands are chosen as potential restoration, enhancement, establishment, or preservation sites. The specific method used to identify suitable mitigation lands is outlined in Section 4.1.1 of this Compensatory Mitigation Plan, as determined through a Level 2 rapid assessment. These lands must either be purchased through fee-title acquisition or protected under a conservation easement through the methods described below in Section 5.3.3 (A) and (B), respectively. To gain approval for permittee-responsible mitigation, a mitigation plan that provides the following information must be submitted to USACE:

1. *Objectives.* A description of the biological resource type(s) and amount(s) that will be provided, the method of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions in the compensatory mitigation project will address the needs of the watershed, ecoregion, physiographic province, or other geographic area of interest.

2. *Site selection.* A description of the factors considered during the site selection process. This description should include consideration of watershed needs, onsite alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site.

3. *Site protection instrument.* A description of the legal arrangements and instrument, including site ownership, that will be used to ensure the long-term protection of the compensatory mitigation project site

4. *Baseline information.* A description of the ecological characteristics of the proposed compensatory mitigation project site and in the case of an application for a USACE permit the impact site. The baseline information should include a delineation of waters of the United States on the proposed compensatory mitigation project site.

5. *Mitigation description.* An explanation of how the compensatory mitigation project will provide the required compensation for unavoidable impacts on aquatic resources resulting from the permitted activity.

6. *Mitigation work plan.* Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures.

7. *Maintenance plan.* A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.

8. *Performance standards.* Ecologically based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives.

9. *Monitoring requirements.* A description of parameters to be monitored to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included.

10. *Long-term management plan.* A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.

11. *Adaptive management plan.* A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.

12. *Financial assurances.* A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standards.

Fulfilling compensatory mitigation requirements through permittee-responsible mitigation will depend on such factors as the availability of suitable natural/disturbed lands with restoration, enhancement, establishment, and preservation opportunities whose owners are willing to establish conservation easements or fee-title acquisition; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management plan, and adaptive management plan; and agency coordination and approval of lands for permittee-responsible mitigation options.

5.3.2 Wildlife and Plant Species

After the use of conservation bank credits, permittee-responsible mitigation is the preferred method of compensatory mitigation for impacts on state and federally listed wildlife and plant species. The primary step for permittee-responsible mitigation is to identify suitable lands that can either be purchased through fee-title acquisition or can be preserved under a conservation easement. The approach used to identify suitable properties is detailed in Section 5.3.4.

Both CDFW and USFWS require compensatory mitigation for impacts on state and federally listed wildlife and plant species, and each agency provides similar guidelines for the process required to complete permittee-responsible mitigation successfully. The requirements for each agency, as outlined in USFWS's *Review Criteria for Section 7 Offsite Compensation* (see Appendix A) and CDFW's *Habitat Management Land Acquisition Process Overview for Applicants* (see Appendix B), are summarized below.

5.3.2.1 U.S. Fish and Wildlife Service

The USFWS requires the following information to initiate the approval process for permittee-responsible mitigation:

1. *Property assurances and conservation easement.* To ensure that the property is legally suitable as a mitigation property, the following documents must be prepared or collected and submitted:

   a. The title report (a Preliminary Title Report at the proposal stage and final title insurance at recordation) shall be no older than 6 months.

   b. Property assessment and warranty.

   c. Subordination agreement (if there is any outstanding debt on the property).

   d. Legal description and parcel map.

   e. Conservation easement (template is available from USFWS).

2. *Site assessment and development.* To ensure that the site is suitable from an environmental perspective, the following must be provided:

   a. A Phase I Environmental Site Assessment.

   b. A Restoration or Habitat Development Plan for the site; not required for preservation.

   c. Construction security: Letter of credit or cashier's check to cover construction on the site, if required.

   d. Performance security: Letter of credit or cashier's check for 20% of construction security in case remedial actions are required. Note: performance bonds are generally waived for a federal or state-agency project applicant.

3. *Site management.* The following must be prepared for site management:

   a. Interim Management Plan: Identifies the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the endowment fund has been fully funded for 1 year and all the performance standards in the development plan have been met. This plan may be the same as the Long-Term Management Plan.

   b. Interim management security analysis and schedule: The purpose of the interim management security is to allow the endowment to grow for at least 1 year without any disbursements, a safeguard to ensure that enough funds will be available in the endowment to pay for future management costs. (This condition may be waived in the case of the Authority/FRA.)

   c. Long-Term Management Plan: Identifies the long-term management, monitoring, and reporting activities to be conducted.

   d. Endowment fund analysis and schedule: Shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Management Plan.

   e. Endowment funding agreement or trust agreement or declaration of trust: The agreement between the endowment holder and the project applicant as to how the endowment is to be funded, held, and disbursed.

5.3.2.2 California Department of Fish and Wildlife

The CDFW requires the following information to initiate the approval process for permittee-responsible mitigation:

1. *Site evaluation*. For preliminary approval of a proposed site, CDFW requires or may request the following:

   a. A completed Proposed Land for Acquisition Form (PLFAF).

   b. A site location map that shows the proposed habitat management land/mitigation site(s).

   c. A site visit by CDFW staff with project applicant and land owners (if land is not owned by applicant).

   d. A biological resources survey.

   e. A Preliminary Title Report.

2. *Preparation and submittal of Habitat Management Land Acquisition (HMLA) package*. The project applicant must submit an HMLA package that contains the following components:

   a. A Phase I Environmental Site Assessment.

   b. A Preliminary Title Report (less than 6 months old) and a policy of title insurance.

   c. Copies of documents supporting any title exceptions or title encumbrances.

   d. Plat map of the property showing existing easements, structures, etc.

   e. County assessor parcel map(s).

   f. Copy of the current tax bill for the property.

   g. Copy of final permit or agreement.

   h. If the project applicant is a business, a copy of the document that specifies the names of the individuals that are legally authorized to sign the documents. For a corporation, trust, or partnership, submit a resolution document on business letterhead.

   i. A Final Management Plan.

   j. A biological resources report.

   k. A draft summary of transactions.

3. *Preparation of deed*. A Conservation Easement Deed or Grant Deed must be drafted to establish a conservation easement or fee-title acquisition, respectively. A conservation easement must be held by CDFW, another government organization, or a non-profit conservation organization.

   a. *Approval of HMLA package*. CDFW must approve and process the final HMLA package.

Fulfilling compensatory mitigation requirements through permittee-responsible mitigation depends on such factors as the availability of suitable natural/disturbed lands that either have confirmed species records or provide connectivity between key natural areas (e.g., Pixley and Allensworth) whose owners are willing to sell the fee-title or a conservation easement; the seasonal limitations associated with presence surveys necessary to determine species presence; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management plan, and adaptive management plan; and agency coordination and approval of lands for permittee-responsible mitigation options.

5.3.3 Permittee-Responsible Mitigation Methodology

The Authority/FRA will select sites using two primary methods currently being employed: an internal analysis of mitigation sites and an external search for mitigation site recommendations. The latter includes contacting both public agencies and private non-governmental organizations. Large non-profit organizations such as the Nature Conservancy and Trust for Public Lands likely have recommendations for potential mitigation sites. Contacting such groups, along with smaller non-governmental organizations (e.g., local land trusts) may result in good leads for mitigation sites or potential easement sites. Biologists will also contact local consulting biologists that may know of land owners interested in placing conservation easements on their properties.

The analysis and selection of mitigation sites is an academic discipline that incorporates ecology, geography, and population genetics. Studies have incorporated everything from conservation area size, shape, and location to population viability analyses, measures of biodiversity, and threat of habitat degradation. Although these data and analyses may greatly enhance selection of appropriate lands for protection, they may be difficult to obtain and often assume that more land is available than can be protected. Given the high level of land conversion in the region and the constraints required for mitigation, the search for potential compensatory mitigation sites focused on the identification of the remaining undeveloped properties and evaluation of their natural resources using existing data.

It is estimated that over 27,600 square kilometers (6,848,000 acres) of land have been converted from natural habitats to agriculture and urban use in the San Joaquin Valley, including 65–95% of the major habitat types represented in the San Joaquin Valley (Kelly et al. 2005). Much of the remaining natural lands were identified in the *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California* (Spencer et al. 2010), which was commissioned by the California Department of Transportation and the CDFW. This Compensatory Mitigation Plan focuses on the natural land blocks that have been determined to provide habitat for native ecosystems and the areas essential to connectivity between them. Conservation of these identified habitats and corridors in conjunction with existing protected areas was determined to be essential to the persistence of biodiverse natural resources in the state.

5.3.3.1 Site Selection Analysis

As part of the internal analysis of mitigation sites, preliminary steps have been taken to identify potential mitigation properties. Using the GIS data created by the California Essential Habitat Connectivity (CEHC) Project and aerial photographs, URS/HMM/Arup Joint Venture biologists selected land parcels that appeared to retain natural habitat and/or jurisdictional water features for analysis. They used ArcGIS Explorer to view Bing hybrid imagery with the natural lands block layer (i.e., the CEHC) visible. The biologists selected the parcels that had the following characteristics:

1. Natural wildlife habitat types (alkali desert scrub, annual grassland, valley foothill riparian, fresh emergent wetland, lacustrine, riverine).
2. Not fully developed (e.g., pasture, cropland, pristine), excluding urbanized areas or high-impact land uses like dairy farms or orchards/vineyards.
3. Within a 0.25-mile buffer of a river or creek.
4. Not owned by public agencies, Native American entities, energy companies, railroad companies, or existing conservation landholders.

This search included both GIS and visual analyses of the entire San Joaquin Valley floor, generally from Fresno to Bakersfield and inclusive of Fresno, Kings, Tulare, and Kern counties.

Using these methods, the biologists identified over 37,500 potentially suitable parcels for compensatory mitigation. These parcels were then scored using available data sources. Two separate analyses were performed on these parcels: one for sites suitable for wildlife mitigation and another to identify sites for potential wetland restoration, creation, or enhancement.

5.3.3.2 Analysis of Jurisdictional Waters

Compensatory mitigation for jurisdictional waters targets sites that feature existing wetlands and emphasizes those sites that are candidates for wetland restoration, creation, and enhancement. To determine which parcels potentially have wetlands, GIS analyses were used to score parcels. A parcel was given a point if it occurred within or intersected with wetlands and features in the:

1. National Wetlands Inventory (USFWS 2009), which identifies the approximate locations and types of wetlands.
2. National Hydrography Dataset (NHD) (USGS and EPA 1999), which identifies the approximate locations and types of aquatic features. To weight these features by intrinsic biological value:
   a. One point was given to canals or ditches.
   b. Two points were given to parcels that intersected streams and canals.
3. Holland Central Valley Vernal Pool Complexes data layer, also known as the CDFW Central Valley Vernal Pool Habitat dataset (Holland 2009), which identifies vernal pool areas.

To assess wetland restoration or enhancement potential and mitigation site quality, parcels were given additional points for meeting the following criteria:

1. If they were within 0.25 mile of a river.
2. Historical data (Kelly et al. 2005) were used to categorize whether parcels formerly occurred in wetland, grassland, or saltbush habitat with potential vernal pools. Any parcel that was historically more than 50% wetlands was automatically given a point, because it was assumed that the parcel had restoration potential; a point was given to parcels that intersected with streams and canals for restoration potential. Any remaining parcel that was historically categorized as more than 50% grassland or saltbush habitat and intersected a potential water source (an NHD canal or river) was visually assessed using National Agriculture Imagery Program (NAIP) 2010 imagery (USDA 2010) to determine if it retained a wetland “signature” or extant wetland.
3. Large parcels provide more habitat for special-status species, are subject to fewer “edge effects” (the correlation between increased changes to an area’s habitat structure along its boundaries associated with increased habitat fragmentation), and potentially represent more than one ecosystem or multiple microhabitats.
4. Parcels adjacent to already protected public lands were scored higher; their acquisition would expand and enhance existing habitat and reduce the threat of further fragmentation.

Table 5-1 shows the criteria used to score select wetland restoration sites. All parcels were identified by watershed to further aid in mitigation site selection (watershed information was taken from the Natural Resources Conservation Service (NRCS) Hydrologic Unit Code Basins dataset) (USDA and NRCS 1999).

Once final scores were calculated, all parcels on the proposed Fresno to Bakersfield alignment were flagged and excluded, as these parcels are unsuitable for offsite compensatory mitigation. Also excluded were parcels smaller than 10 acres. Parcels of this size are not likely to be worth the administrative costs involved in wetland conservation or restoration. All data collected are stored in a searchable Microsoft Access database.

Table 5-1
Data Collected to Score Wetland Mitigation Sites

Criteria	Score	Source of Data
Vernal pool	1 point if present	Holland Vernal Pool Layer (Holland 2009)
Wetlands	1 point if present	National Wetlands Inventory (USFWS 2009)
Canal or ditch present	1 point	NHD (USGS and EPA 1999)
River or creek present	2 points	NHD
Riparian restoration potential: Within 0.25 miles of river/ creek	1 point	GIS analysis
Wetland restoration potential: Historic data analysis / visual assessment	1 point	Kelly et al. 2005
Size	<10 ac = 0 10–100 ac = 1 point 101–500 ac = 2 points >500 ac = 3 points	GIS analysis
Adjacent to protected natural land	1 point if adjacent to natural land	Reference public lands layer / aerial photos
Watershed data	Not scored	HUC 8

GIS = Geographic Information System
HUC = Hydrologic Unit Code
NHD = National Hydrography Dataset

5.3.3.3 Wildlife Species Analysis

Using similar methodology, GIS analysis was used to identify potential wildlife mitigation sites. A parcel was scored higher if it had a particular resource or attribute indicating conservation value. Parcels were analyzed for the following categories and point system:

1. Parcel size: Large parcels provide more habitat for special-status species, are subject to fewer “edge effects” associated with habitat fragmentation, and potentially represent more than one ecosystem or multiple microhabitats.

2. Location: Parcels that are adjacent to already protected public lands would expand and enhance existing habitat and reduce the threat of further fragmentation.

3. Connectivity: Parcels that extend between and connect large parcels contribute to re-establishing or maintaining connectivity as assessed by the CEHC Project (Spencer et al. 2010). Connectivity is considered essential for long-term persistence of species. Connections between large blocks of habitat may maintain gene flow between populations, allow for metapopulation dynamics, and provide corridors for movement in the face of climate change and subsequent changes and shifts in habitat distributions.

4. Linkage: Parcels that occur on a wildlife movement corridor identified in *Missing Linkages: Restoring Connectivity to the California Landscape* (Penrod et al. 2001) have notable value.

5. Special-status species: Any special-status species observations (plants and animals) recorded on or near the parcel were given 1 point per species recorded. These data were generated from the California Natural Diversity Database (CNDDB)/RareFind (CDFG 2011), which records observations of special-status plant and wildlife species, CDFW-designated special-status plant communities, and California Native Plant Society (CNPS)-listed special-status plant species.

6. Critical habitat designations: Parcels within federally designated or proposed critical habitats for federal candidate, proposed, threatened, or endangered special-status wildlife and plant species (USFWS 2011) have notable value.

7. San Joaquin kit fox core, satellite, or linkage areas: *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998*),* and *San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation* (USFWS 2010) identified core, satellite, and linkage areas. Parcels within these mapped regions were given points based on their relative values to kit fox, as follows: core areas (3 points), satellite areas (2 points), and linkage areas (1 point).

8. Wetland features: Wetland features are valuable resources for wildlife and plant species. The presence of each of the following features was awarded 1 point: vernal pools, wetlands/riparian areas, and areas within 0.25-mile of a river.

9. California Wildlife Habitat Relationship System (CWHR): One point was awarded for this category, and each parcel's habitat type was noted for future reference.

10. The Kern County Valley Floor Habitat Conservation Plan (HCP) (Kern County Planning Department 2006) defined conceptual preserves that were mapped in red (highest priority) and green (second-highest priority). For Kern County, parcels were given 2 points if they were in the red zone, and 1 point for the green zone.

Table 5-2 enumerates the possible values scored. As with the wetland site selection analysis, parcels along the current Fresno to Bakersfield alignment and those that are less than 10 acres in area were excluded from further consideration.

All of the data collected for the wildlife site selection analysis are stored in a searchable Microsoft Access database to aid in the offsite compensatory mitigation selection process.

5.3.3.4 Permission to Enter

URS/HMM/Arup Joint Venture biologists compiled these data for the wildlife and wetland mitigation sites to generate a list of the high-scoring parcels in each category. Permission-to-enter (PTE) letters were mailed to the top ~500 property owners of high-scoring parcels (~750 assessor parcel numbers [APNs]). In response to the PTE effort, by March 2, 2012, a total of 141 landowners had responded allowing PTE.

Table 5-2
Wildlife Mitigation Site Selection Analysis

Criteria	Subcriteria	Score	Data Source
Size	—	<10 ac = 0 10–100 ac = 1 point 101–500 ac = 2 points >500 ac = 3 points	GIS analysis
Adjacent to protected natural land	—	1 point if adjacent to natural land	Reference public lands layer / aerial photos
Habitat connectivity	—	1 point if present	California Essential Habitat Connectivity Project (Spencer et al. 2010)
Habitat linkages	—	1 point per linkage	California Missing Linkages Report (Penrod et al. 2001)
Special-status species	—	1 point for each species	CNDDB data (CNDDB 2011)
Critical habitat/ recovery areas	—	1 point per designation	USFWS data
San Joaquin kit fox	Core	3 points	GIS analysis
	Satellite	2 points	GIS analysis
	Linkage	1 point	GIS analysis
Wetlands	Vernal pool	1 point if present	Holland Vernal Pool Layer (Holland 2009)
	Riparian/wetland	1 point if present	National Wetlands Inventory (USFWS 2009)
	Riparian restoration potential: Within 0.25-mile of river/ creek	1 point	GIS analysis
Kern County Valley Floor Habitat Conservation Plan	Kern County only	Red zone = 2 points Green zone = 1 point	Kern County Valley Floor Habitat Conservation Plan (Kern County Planning Department 2006)

ac = acre
CNDDB = California Natural Diversity Database
GIS = Geographic Information System
USFWS = U.S. Fish and Wildlife Service

5.3.3.5 Reconnaissance-Level Site Assessments

After the potential offsite mitigation properties were identified and prioritized through a desk-top analysis and PTE was secured, reconnaissance-level site assessments were performed to ground-truth the suitability of each property as potential mitigation land. Depending on the resource(s) of interest, these site assessments consisted of a combination of windshield surveys, interviews with landowners and regional biologists, and/or site visits. Unsuitable properties were removed from further analysis.

Jurisdictional Waters

For all PTE properties where aquatic habitats have been documented or where the opportunity to preserve, enhance, or restore aquatic habitats may be present, a reconnaissance-level site assessment was performed to ground-truth the suitability of each property as potential mitigation land.

The reconnaissance-level site assessment included background research to identify the locations of aquatic features potentially present on site, as determined using the NRCS's HUC Basins dataset (USDA and NRCS 1999), and a site visit. The background research involved a review of the RWQCB basin plans, the identification of watershed and sub-watershed areas, surface water features, and the beneficial uses identified in *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and San Joaquin River Basin* (CVRWQCB 2007) and the *Water Quality Control Plan for the Tulare Lake Basin* (CVRWCB 2004). The background research also included a review of existing data from the USFWS, U.S. Geological Survey (USGS), and CDFW to determine the locations, types, and potential extent of known waters of the U.S., waters of the state (including wetlands), and CDFW lakes and streambeds potentially present.

For all properties (PTE and non-PTE) where riparian habitat has been documented or where suitable habitat for this habitat of concern may be or was historically present within creek riparian zones, a reconnaissance-level site assessment was performed to ground-truth the suitability of each property as potential mitigation land.

After potential mitigation properties were identified, wetland delineations and CRAM will be used to inform the mitigation planning decisions, including final site selection; the ecological lift, or benefits, of mitigation; and mitigation ratios. Rapid assessment data will be used to determine which mitigation sites could benefit from restoration or enhancement.

A comparison of the baseline and mitigation site data will be used to determine the net ecological lift associated with the mitigation activity. The net ecological lift will replace or compensate for the loss of wetlands or natural habitat areas. Mitigation ratios associated with specific mitigation activities will be determined through coordination with the regulatory agencies consistent with the *Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2012).

Wildlife Species

For all PTE properties where special-status plant and/or wildlife species have been documented or where suitable habitat for these species is present, a reconnaissance-level site assessment was performed to ground-truth the suitability of each property as potential conservation land.

The reconnaissance-level site assessment involved background research to identify the locations of plant and/or wildlife species potentially present on site through review of existing special-status plant and wildlife species databases and agency information. Database queries included all reported plant and wildlife species occurrences within 10 miles or potentially found within the various USGS 7.5-minute quadrangles (quads) that overlap with the potential sites and the eight

surrounding quads (collectively referred to as the nine-quad search area). The following data sources were used:

- USFWS Sacramento Field Office web site.
- California Department of Fish and Wildlife CNDDB RareFind Query.
- CNPS's Online Inventory of Rare and Endangered Plants of California (CNPS 2010).

5.3.3.6 Agency Coordination

During the compensatory mitigation identification process, the permittee has been coordinating with agency personnel to determine which existing mitigation bank credits, in-lieu fee programs, or other funding opportunities would be suitable to partially or fully mitigate impacts on biological resources. Similarly, additional coordination will be initiated with agency personnel to determine which properties identified during reconnaissance-level site assessments would be suitable and capable of being approved by the appropriate agencies to partially or fully mitigate impacts on biological resources through conservation easements, fee-title acquisition, or mitigation/conservation banks. Agency coordination may take the form of individual site visits, agency meetings/calls, or working groups.

On May 7, 2012, prospectuses describing the existing resources at five prospective mitigation sites (Buena Vista Dairy, Yang, Davis, Valadez, and Staffel) were provided to USFWS, CDFW, USACE, and the EPA for their review and comment.

In September and October 2012, technical memorandums describing conceptual wetland restoration, enhancement, establishment, and preservation opportunities at three additional prospective mitigation sites (Fagundes, Peck Island, and Panorama Vista Preserve), were submitted to USACE and EPA for their review and comment.

Ongoing coordination with agency personnel will be critical in parcel identification and approval and to help identify what additional steps are necessary to approve potential properties and/or to partially or fully mitigate existing/remaining impacts on biological resources.

5.3.3.7 Focused Surveys

For those properties where PTE was provided, the properties of approximately 50 landowners were identified for further surveys consisting of a reconnaissance-level site visit to ground-truth each parcel's value as a potential permittee-responsible mitigation property. Reconnaissance-level site visits were performed December 28 through 30, 2012. Of those properties investigated, 12 properties (~7,218 ac) were identified as optimal for permittee-responsible mitigation and *constitute the permittee-responsible mitigation options currently under investigation. The need for* additional surveys, such as focused surveys for special-status wildlife species, will be determined in coordination with the appropriate permitting agencies.

Jurisdictional Waters Surveys

Formal wetland delineations were performed on these properties in April 2012 and have been digitized. With the intent of identifying jurisdictional waters, teams of qualified biologists walked meandering transects to visually survey each PTE property for waters of the U.S., waters of the state, including CDFW-jurisdictional resources. Survey transects were spaced 20 to 100 feet apart or as appropriate to the quality, topography, and character of the areas being examined.

The extent of all observed waters of the U.S. and waters of the state (including wetlands) and CDFW lakes and streambeds were identified and mapped using a handheld Global Positioning System unit with sub-meter accuracy. The locations of waters of the U.S. and waters of the state

(including wetlands) and CDFW lakes and streambeds were marked on hard-copy maps. An assessment of the functions and services they provide was also performed.

Aerial imagery, historical aerial photography, topographic maps, and available hydrological data were used to review the jurisdictional status of features identified in the field, based on post-Rapanos guidance by USACE (USACE and EPA 2007). Special attention was paid to documenting opportunities to preserve, enhance, restore, or create aquatic habitats.

CRAM Surveys

A formal evaluation of jurisdictional waters (CRAM) was completed in May 2012 to assess the functions and services (health) of wetlands and other aquatic features consistent with the USACE and EPA Mitigation Rule (USACE and EPA 2008). The CRAM evaluation included recording and evaluating all wetland types identified on site, including riverine wetlands and depressional wetlands, based on buffer and landscape context, hydrology, physical structure, and biotic structure using various metrics (and submetrics) to address wetland class-specific relationships. The average of these four attribute scores was used to determine the overall a CRAM "Index Score".

Special-Status Wildlife Surveys

Special-status wildlife species surveys will consist of meandering pedestrian transects widely spaced to cover the property, based on the quality, topography, and character of the habitat being evaluated.

The wildlife surveys will consist of the following general activities:

- Map habitat that may be suitable for special-status wildlife species.
- Confirm, identify, map, and describe known or previously unreported occurrences of special-status species.
- Map relevant wildlife macro- or micro-habitat elements.
- Map and describe the primary constituent elements within areas of federally designated or proposed critical habitat units.

Additional focused surveys (such as wet/dry season sampling for vernal pool branchiopods; raptor surveys for Swainson's hawk; breeding/wintering season surveys for burrowing owls; and small-mammal trapping, camera stations, and/or track plates for San Joaquin kit fox, Nelson's antelope squirrel, and Tipton kangaroo rat) may be required to confirm species presence. Special-status wildlife species survey plans will be developed in accordance with agency protocols and guidance documents and submitted to USFWS and/or CDFW for approval.

5.3.3.8 Adjacent-Parcel Analysis

For those properties currently under investigation, adjacent-parcel analyses were performed to identify additional land acquisition opportunities. The intent of these analyses was to expand the contiguous acreage of a proposed mitigation site. Doing so helps buffer the initial mitigation site, provides for habitat and wildlife movement connectivity, and minimizes habitat fragmentation and edge effects, thereby helping to alleviate environmental stressors on the surrounding landscape and watershed. As adjacent parcels are identified, they will be subject to the same methodology outlined above to bring them in line with the initial mitigation site. The need for additional surveys, such as focused surveys for special-status wildlife species, may be informed by previous survey efforts at the initial mitigation site and will be determined in coordination with the appropriate permitting agencies.

5.3.3.9 Title Reports

Based on the results of these analyses, the URS/HMM/Arup Joint Venture subsequently contacted the landowners of the properties currently under consideration to positively confirm their understanding of, and continued interest in pursuing, the mitigation/conservation process. Title reports have been requested for each individual APN under investigation and are under review. Additional investigations may be necessary to determine the details of any existing easements or encumbrances at these locations.

5.4 Recommended Mitigation Options by Resource

Through careful consideration of the various mitigation opportunities available, agency-specific prioritization preferences for mitigation options, project funding considerations, and project timeline restrictions, individual mitigation options will be identified by resource to mitigate project impacts. Where possible, mitigation/conservation banks, in-lieu fee programs, and permittee-responsible mitigation options that provide opportunities to receive credit for multiple species and/or resources (i.e., “nested” or “layered” mitigation) will be prioritized over options that provide limited species and/or resource overlap.

Several mitigation/conservation banks and permittee-responsible mitigation options have been identified that may be suitable to partially or fully mitigate potential impacts on biological resources. Table 5-3 provides a summary of these mitigation options.

5.4.1 Mitigation/Conservation Banks

Three mitigation banks are currently under consideration to mitigate for project impacts: the Sand Creek Conservation Bank, Deadman Creek Conservation Bank, and Kreyenhagen Mitigation Bank. These banks only provide USFWS-approved mitigation/conservation credits. Further coordination with USFWS will be necessary to determine the extent to which project impacts can be mitigated through credit purchases at these banks whose service areas overlap portions, rather than the full extent, of the Fresno to Bakersfield section.

5.4.1.1 Sand Creek Conservation Bank

The 497-acre Sand Creek Conservation Bank, in Tulare County (see Figure 5-1), provides conservation credits for vernal pool preservation and five species of interest: vernal pool fairy shrimp, California tiger salamander (upland/aquatic habitat), San Joaquin kit fox, western burrowing owl, and Swainson’s hawk. The Sand Creek Conservation Bank is administered by Wildlands, Inc., and a USFWS-approved conservation bank. This bank’s service area for California tiger salamander and San Joaquin kit fox generally encompasses the northern portion of the project, extending along the east side of the valley floor from Fresno as far south as Visalia (portions of Fresno, Kings, and Tulare counties); the service area for vernal pool preservation and vernal pool fairy shrimp does not encompass the project; it is limited to the east side of the valley floor (portions of Fresno and Tulare counties). The Sand Creek Conservation Bank may also provide suitable foraging habitat for Swainson’s hawk and burrowing owl, providing opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat for these species overlap. No service areas have been established for this bank for either Swainson’s hawk or burrowing owl, but the CDFW can approve these areas on a case-by-case basis.

Table 5-3
Mitigation Options Identified to Date

	Available Mitigation for Special-Status Wildlife Species (acres) (Listing Status: federal/state)												Available Mitigation for Jurisdictional Waters (acres)						
MITIGATION SITE (total acreage) **Agency Approval Status**	**San Joaquin kit fox (FE/ST)**	**Tipton kangaroo rat (FE/SE)**	**Fresno kangaroo rat (FE/SE)**	**San Joaquin Antelope squirrel (--/ST)**	**Blunt-nosed leopard lizard (FE/SE,FP)**	**Vernal pool fairy shrimp (FT/--)**	**Vernal pool tadpole shrimp (FE/--)**	**California tiger salamander [upland] (FT/ST)**	**California tiger salamander[Aquatic] (FT/ST)**	**Western burrowing owl (--/CSC)**	**Swainson's hawk (--/ST)**	**Valley elderberry longhorn beetle (FT/--)**	**Vernal pool preservation**	**Vernal pool restoration**	**Riparian woodland restoration**	**Riparian woodland preservation**	**Seasonal wetland restoration**	**Seasonal wetland preservation**	**Stream corridor preservation**
SAND CREEK CONSERVATION BANK (497 ac) **USFWS:** Approved **CDFW:** Not Approved	358	--	--	--	--	10 (Sierra foothill)[b]	--	358[c]	10 (Sierra foothill)[c]	358[a] (CEQA)	358[a]	--	--	--	--	--	--	--	--
DEADMAN CREEK CONSERVATION BANK (710 ac) **USFWS:** Approved **CDFW:** Not Approved	136	--	--	--	--	40 (Central Valley)	40 (Central Valley)	136	--	136[a] (CEQA)	136[a] (CEQA)	--	40 (Central Valley)	--	--	--	--	--	--
KREYENHAGEN MITIGATION BANK (1,600 ac) **USFWS:** Approved **CDFW:** Not Approved	266[b]	--	--	--	--	--	--	--		266[a] (CEQA)	266[a] (CEQA)	--	--	--	--	--	--	--	--

[a] Acreage of potential burrowing owl/Swainson's hawk habitat present; actual available acreage to be determined through consultation with CDFW under CEQA

[b] To Be Determined: Service area may be negotiable with CDFW/USFWS

[c] USFWS would consider extending a variance at the Sand Creek Conservation Bank to allow mitigation credits for California tiger salamander impacts outside of the bank's established service area.

ac = acre
CEQA = California Environmental Quality Act
CDFW = California Department of Fish and Wildlife
USFWS = U.S. Fish and Wildlife Service

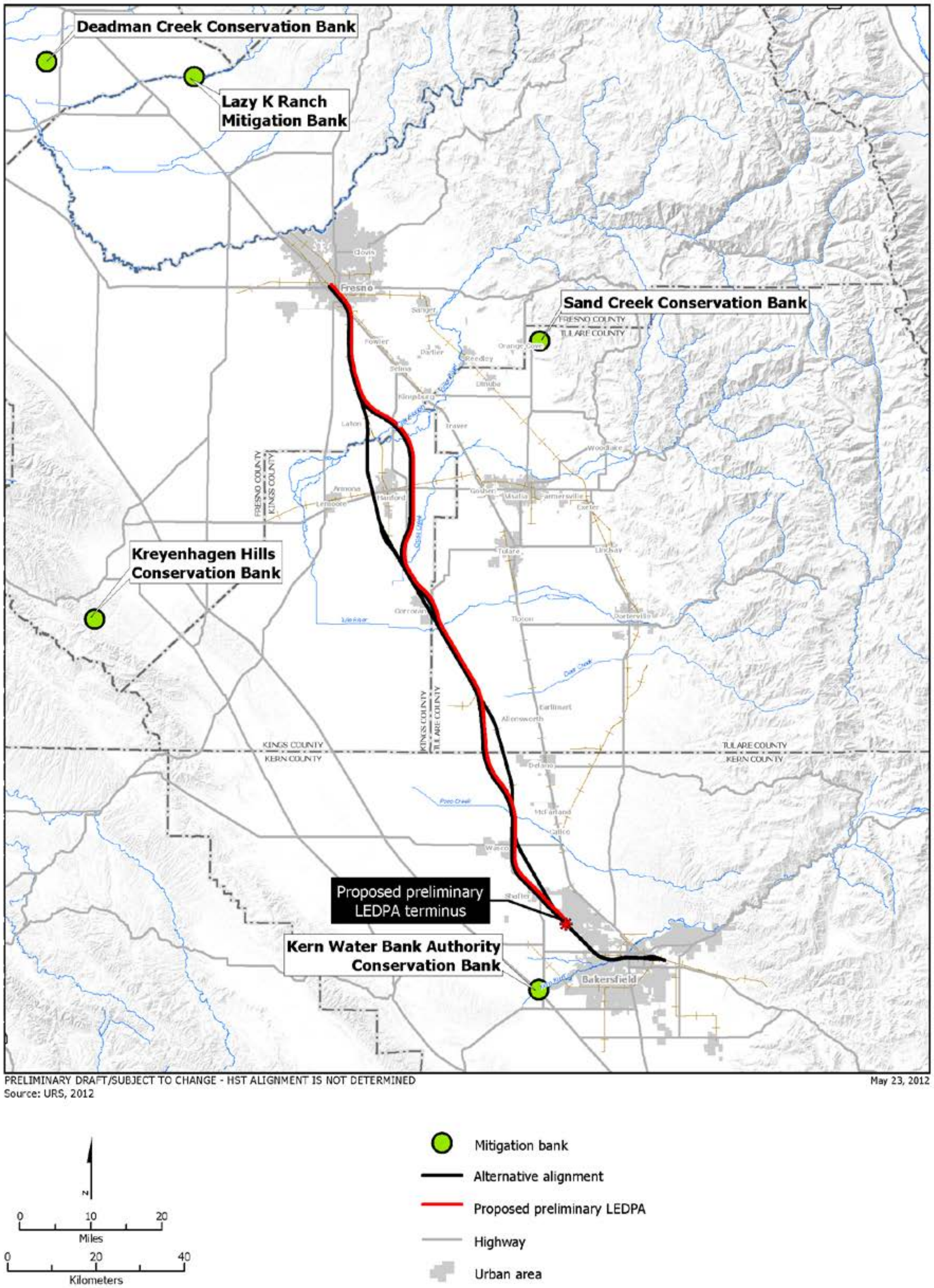

Figure 5-1
Mitigation bank locations

As reported in *A Status Review of the California Tiger Salamander (*Ambystoma californiense*)* (CDFG 2010), the South San Joaquin genetically distinct population of California tiger salamander extends along the southwestern San Joaquin Valley floor, beginning in Madera County (just south of the Mariposa/Merced county line); goes through Fresno County; and extends partially into Tulare and Kings counties as far south as the Tule River. The Sand Creek Conservation Bank is in Tulare County and its service area for California tiger salamander coincides with this genetically distinct population.

On March 6, 2012, Fish and Wildlife Biologist Ben Watson offered written confirmation that USFWS would consider extending a variance at the Sand Creek Conservation Bank to allow mitigation credits for California tiger salamander impacts outside of the bank's established service area.

5.4.1.2 Deadman Creek Conservation Bank

The 710-acre Deadman Creek Conservation Bank, in Merced County (see Figure 5-1), provides conservation credits for vernal pool preservation and five species of interest: vernal pool fairy shrimp, vernal pool tadpole shrimp, San Joaquin kit fox, western burrowing owl, and Swainson's hawk. The Deadman Creek Conservation Bank is administered by Wildlands, Inc., and is a USFWS-approved conservation bank. This bank's service area for San Joaquin kit fox generally encompasses the northern portion of the project, extending along the central and east side of the valley floor from Fresno as far south as Visalia (portions of Fresno, Kings, and Tulare counties); the service area for vernal pool preservation, vernal pool fairy shrimp, and vernal pool tadpole shrimp generally encompasses the central and southern portions of the project, extending along the valley floor from north of Visalia as far south as Rosedale (portions of Fresno, Kings, Tulare, and Kern counties). The Deadman Creek Conservation Bank may provide opportunities to "nest" or "layer" mitigation for multiple species where suitable habitat for these species overlap. No service areas have been established for this bank for Swainson's hawk or burrowing owl, but CDFW can approve them on a case-by-case basis.

5.4.1.3 Kreyenhagen Mitigation Bank

The 1,600-acre Kreyenhagen Mitigation Bank, in Fresno County (see Figure 5-1), provides conservation credits for three species of interest: San Joaquin kit fox, western burrowing owl, and Swainson's hawk. The Kreyenhagen Mitigation Bank is administered by Wildlands, Inc., and is a USFWS-approved conservation bank. This bank's service area for San Joaquin kit fox is limited to the east side of the valley floor (portions of Fresno, Kings, and Kern counties). The Kreyenhagen Mitigation Bank may also provide suitable foraging habitat for burrowing owl, providing opportunities to "nest" or "layer" mitigation for multiple species where suitable habitat for these species overlap. No service areas have been established for this bank for burrowing owl, but CDFW can approve these areas on a case-by-case basis.

5.4.2 Conservation Easement/Fee-Title Acquisition

Twelve permittee-responsible mitigation properties (~7,218 ac) have been identified as optimal for permittee-responsible mitigation and constitute the permittee-responsible mitigation options currently under investigation (Figure 5-2). These properties include lands adjacent to or in the immediate vicinity of protected lands like the Kern National Wildlife Refuge, Allensworth Ecological Reserve, Kern Water Bank Authority Conservation Bank, Semitropic Ecological Reserve, and Center for Natural Lands Management lands. Some of the properties overlap areas designated as vernal pool fairy shrimp critical habitat, vernal pool tadpole shrimp critical habitat, and California tiger salamander critical habitat and encompass portions of major watershed features such as Cross Creek, Kern River, Kings River, Poso Creek, and Tule River, or areas designated as wildlife movement corridors (Figure 5-3). These mitigation options are described below.

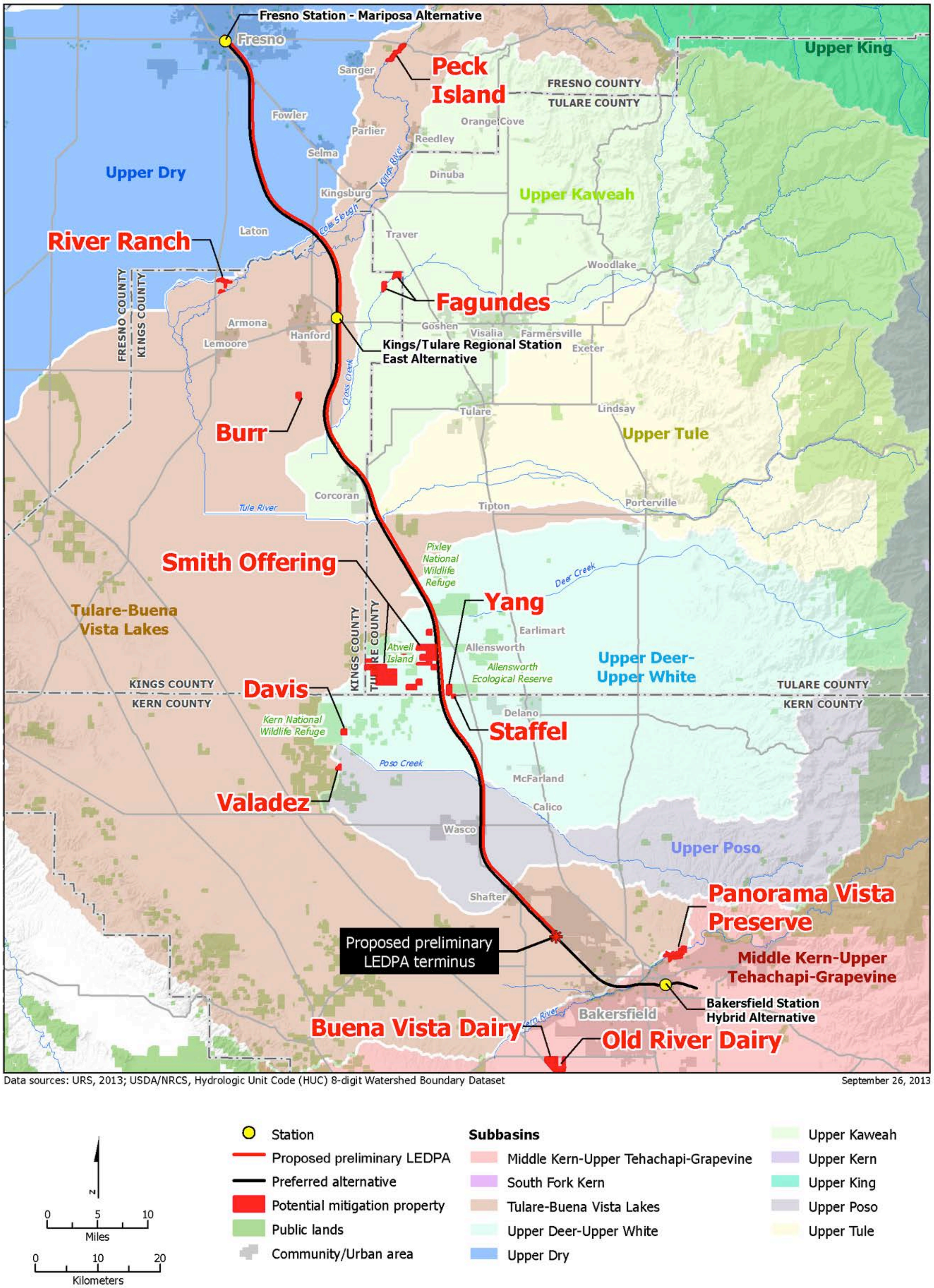

Figure 5-2
Location overview of potential mitigation properties

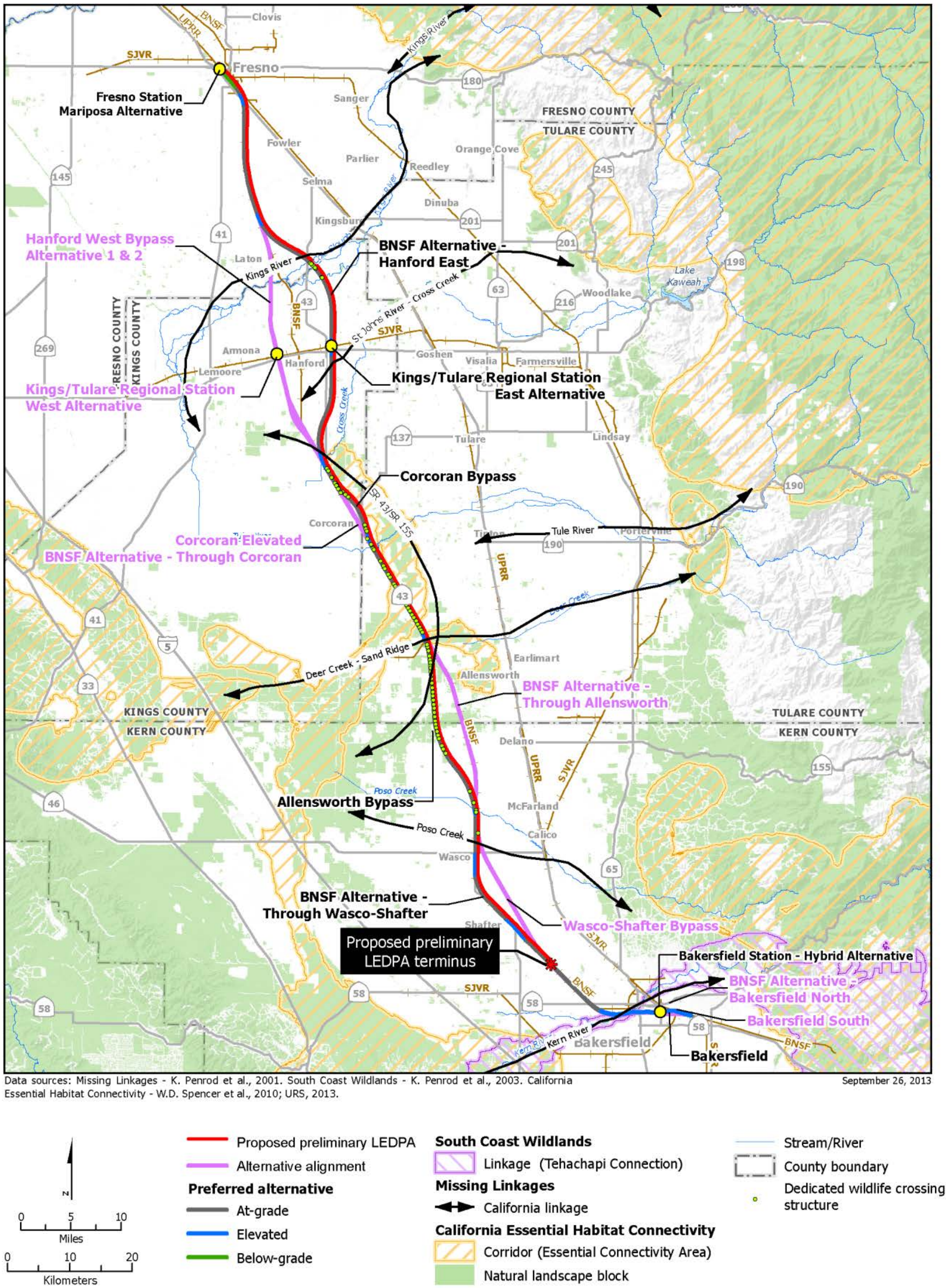

Figure 5-3
Wildlife movement corridors

5.4.2.1 Burr Ranch

Through public outreach, one property was identified that was available for purchase: the Burr Ranch property. The 198-acre Burr Ranch property, in Guernsey, Kings County, consists of approximately 15 acres of alkali sink scrub habitat and approximately 170 acres of alkaline California annual grassland habitat (Appendix C). In 2011, Biologist Rob Hansen (Hansen's Biological Consulting) confirmed that a pair of Swainson's hawks was nesting onsite (Hansen 2011, personal communication). The site provides 185 acres of suitable foraging habitat for this species. CDFW biologist Krista Tomlinson has also suggested that under certain circumstances the Burr Ranch property may be a good site for Tipton kangaroo rat translocation (Hansen 2011, personal communication). Further negotiation would be required with CDFW to determine whether this property would provide suitable foraging habitat as mitigation for project impacts on Swainson's hawk and to determine what additional steps would be required to ascertain the potential for using this property as mitigation for western burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox.

In late summer 2012, the Clark family sold the larger of the two parcels for agricultural land. The remaining 40-acre parcel includes the Swainson's hawk nest.

Future coordination with agency personnel will be critical in the development of a conservation easement or fee-title acquisition of the property and to help identify what additional steps are necessary to attain agency approval to include the 40-ac parcel as a part of the FB HST mitigation package.

5.4.2.2 Buena Vista Dairy

The Buena Vista Dairy properties consist of two adjacent parcels in Kern County (Appendix C, Buena Vista Dairy Figures 1–3). The two parcels total 715 acres (161 and 554 acres), are predominantly undisturbed, and show evidence of intact, natural communities, including alkali desert scrub, annual grassland, an extensive network of vernal pools, and depressional wetlands formed from remnant riverine features. The parcels are bounded by Interstate 5 (I-5) to the west, Taft Highway 119/Old River Road to the north, and active agricultural land to the south and east. The parcels are just south of the Kern Water Bank.

Together with portions of the Kern Water Bank, the Buena Vista Dairy properties and the surrounding natural lands provide approximately 5,000 acres of contiguous open space east of I-5 suitable for special-status wildlife species. The natural vegetation communities present on site provide relatively undisturbed, high-quality habitat suitable for blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity, and have been reported or have the potential to be present on the properties.

On site, 83.7 acres of vernal pools and 33.6 acres of depressional wetlands have been identified. Aquatic and upland habitats on the properties provide suitable opportunities for rehabilitation and preservation. The preservation and potential rehabilitation of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

Biologists conducted small-mammal trapping, spot-lighting, camera-trapping, and pedestrian-transect surveys in 2012, backed by agency coordination (see Appendix C). These surveys confirmed the onsite presence of western burrowing owl and Tipton kangaroo rat. Potential kit fox scat was collected and sent to Dr. Ben Sacks, Canid Diversity and Conservation Unit Center for Veterinary Genetics at University of California, Davis, for genetic analysis. Additional surveys may be necessary to confirm the presence of blunt-nosed leopard lizard, Swainson's hawk, Nelson's antelope squirrel, and San Joaquin kit fox. Endangered Species Recovery Program

(ESRP) (California State University, Stanislaus) biologist Brian Cypher has confirmed that the Buena Vista Dairy properties provide high-quality habitat for blunt-nosed leopard lizard, Nelson's antelope squirrel, and San Joaquin kit fox.

5.4.2.3 Yang Properties

The Yang properties consist of 316.4 acres on eight adjacent parcels in Kings County (Appendix C, Yang Figures 1–3). The parcels are predominantly undisturbed, and show evidence of intact, natural communities, including alkali desert scrub and annual grassland. The Yang properties are in the Upper Deer–Upper White HUC 8 watershed and feature extensive, mostly undisturbed vernal pools. The parcels border the Allensworth Ecological Reserve to the east without any fence lines or impediments to terrestrial or hydrologic connectivity.

Together with the Allensworth Ecological Reserve and the Staffel Family Trust property (a 61-acre parcel also under consideration as a proposed mitigation property), the Yang properties and the surrounding natural lands provide approximately 1,790 acres of contiguous open space west of State Route 43 suitable for special-status plant and wildlife species. The natural vegetation communities observed on the property provide relatively undisturbed, high-quality habitat suitable for vernal pool fairy shrimp, blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the properties.

Some 97.7 acres of vernal pools have been identified onsite. Aquatic and upland habitats on the Yang properties provide suitable opportunities for rehabilitation and preservation. Such actions would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

Using the data from the Allensworth Ecological Reserve and small-mammal trapping, spot-lighting, camera-trapping, and pedestrian-transect surveys in 2012, biologists have confirmed the presence of vernal pool fairy shrimp, blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox on the Yang properties (see Appendix C). Potential kit fox scat was collected and sent to Dr. Ben Sacks, Canid Diversity and Conservation Unit Center for Veterinary Genetics at University of California, Davis, for genetic analysis. Additional surveys may be necessary to confirm the presence of vernal pool fairy shrimp and Nelson's antelope squirrel; however, ESRP biologist Brian Cypher has confirmed that the Yang properties provide high-quality habitat for Nelson's antelope squirrel.

5.4.2.4 Staffel Family Trust Property

The Staffel Family Trust (Staffel) property consists of a single parcel in Kern County (Appendix C, Staffel Family Figures 1–3). This parcel is 61.2 acres and predominantly undisturbed; it shows evidence of intact, natural communities, including alkali desert scrub and annual grassland. Vernal pools are present in the northern portion of the property and small depressional seasonal wetlands are present along the parcel edges. The northern end of the parcel abuts the Allensworth Ecological Reserve. The Staffel property is separated from the Allensworth Ecological Reserve by an at-grade, two-track dirt road, which creates a small break in vernal pool habitat but does not impede hydrologic or terrestrial connectivity.

Together with the Allensworth Ecological Reserve and the Yang properties (a 316.4-acre property also under consideration as a proposed mitigation property), the Staffel property and the surrounding natural lands provide approximately 1,790 acres of contiguous open space west of State Route 43 suitable for special-status plant and wildlife species. The natural vegetation communities on the property provide relatively undisturbed, high-quality habitat suitable for vernal pool fairy shrimp, blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl,

Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the property.

Some 2.8 acres of vernal pools and 0.1 acre of depressional wetlands have been identified onsite. Aquatic and upland habitats on the property provide suitable opportunities for rehabilitation and preservation. Hydrological modifications on the property may establish or enhance connectivity with the adjacent Allensworth Ecological Reserve. The preservation and potential rehabilitation of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

Using the data from the Allensworth Ecological Reserve and small-mammal trapping, spot-lighting, camera-trapping, and pedestrian-transect surveys in 2012, biologists have confirmed the presence of vernal pool fairy shrimp, blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox at the Staffel property (see Appendix C). Potential kit fox scat was collected and sent to Dr. Ben Sacks, Canid Diversity and Conservation Unit Center for Veterinary Genetics at University of California, Davis, for genetic analysis. Additional surveys may be necessary to confirm the presence of vernal pool fairy shrimp and Nelson's antelope squirrel. ESRP biologist Brian Cypher has confirmed that the Staffel property provides high-quality habitat for Nelson's antelope squirrel.

5.4.2.5 Davis Property

The Davis property consists of a single parcel number in Kern County (Appendix C, Davis Figures 1–3). The parcel is 158 acres and predominantly undisturbed; it shows evidence of intact, natural communities, including alkali desert scrub and annual grassland. The site features surface drainage and a large vernal swale extending from the northeastern region of the property to the southwestern corner and seasonal depressional wetlands that are concentrated along the western edge of the parcel. The parcel is bounded by the Semitropic Ecological Reserve to the north, south, and east, and is separated from the Kern National Wildlife Refuge by Corcoran Road to the west.

Together with the Semitropic Ecological Reserve, the Kern National Wildlife Refuge, and the Valadez property (a 120-acre parcel also under consideration as a proposed mitigation property), the Davis property and the surrounding natural lands provide more than 50,000 acres of contiguous open space east of Interstate 5 suitable for special-status plant and wildlife species. The natural vegetation communities observed on the property provide relatively undisturbed, high-quality habitat suitable for blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on site.

Some 28.3 acres of vernal pools and 4.1 acres of depressional wetlands have been identified onsite. Aquatic and upland habitats on the property provide suitable opportunities for rehabilitation and preservation. Hydrological modifications on the property may establish or enhance connectivity with the adjacent Kern National Wildlife Refuge. The preservation and potential rehabilitation of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

Using the data from CDFW surveys, Kern National Wildlife Refuge, and small-mammal trapping, spot-lighting, camera-trapping, and pedestrian-transect surveys in 2012, biologists have confirmed the presence of Swainson's hawk, western burrowing owl, and Tipton kangaroo rat on

the Davis property (see Appendix C). Additional surveys may be necessary to confirm the presence of vernal pool fairy shrimp, blunt-nosed leopard lizard, Nelson's antelope squirrel, and San Joaquin kit fox. ESRP biologist Brian Cypher has confirmed that the Davis property provides high-quality habitat for blunt-nosed leopard lizard, Nelson's antelope squirrel, and San Joaquin kit fox.

5.4.2.6 Valadez Property

The Valadez property consists of a single parcel in Kern County (Appendix C, Valadez Figures 1–3). The parcel is 120 acres and moderately disturbed; it shows evidence of intact natural communities, including alkali desert scrub, annual grassland, and vernal pools. The property features surface drainage, a man-made wetland basin, and vernal pools in the northern portion of the site. The parcel is surrounded by the CDFW-owned Semitropic Ecological Reserve.

Together with the Semitropic Ecological Reserve, the Kern National Wildlife Refuge, and the Davis property (a 158-acre parcel also under consideration as a proposed mitigation property), the Valadez property and the surrounding natural lands provide more than 50,000 acres of contiguous open space east of Interstate 5 suitable for special-status plant and wildlife species. The natural vegetation communities on the property provide moderately disturbed habitat suitable for blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the property.

Some 0.2 acre of vernal pools and 0.8 acre of depressional wetlands have been identified onsite. Aquatic and upland habitats on the property provide suitable opportunities for rehabilitation and preservation. Hydrologic modifications on the property may provide or enhance connectivity with the adjacent Kern National Wildlife Refuge and Semitropic Ecological Reserve. The preservation and potential rehabilitation of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

Using the data from CDFW surveys, the Kern National Wildlife Refuge, and small-mammal trapping, spot-lighting, camera-trapping, and pedestrian-transect surveys in 2012, biologists have confirmed the presence of Swainson's hawk, western burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox at the Valadez property (see Appendix C). Additional surveys may be necessary to confirm the presence of vernal pool fairy shrimp, blunt-nosed leopard lizard, and Nelson's antelope squirrel. ESRP biologist Brian Cypher has confirmed that the Valadez property provides high-quality habitat for blunt-nosed leopard lizards and Nelson's antelope squirrels.

5.4.2.7 Fagundes Properties

The Fagundes properties consist of two parcels in Kings County (Appendix C, Fagundes Figures 1–4). Parcel A (250 acres) and Parcel B (155 acres) lie to the west of SR 99, approximately 12 miles northwest of Visalia. These two parcels support grasslands with scattered vernal pool complexes and riparian habitat along Cross Creek. The creek defines the southern boundary of Parcel A and the eastern boundary of Parcel B.

These two parcels compose the southwestern end of a corridor of open space that is bisected by SR 99 and surrounded by agricultural lands, primarily row crops. This corridor follows Cross Creek and is mapped as critical habitat for the federally listed vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamander (see Appendix C). Conservation of the Fagundes properties would contribute approximately 405 acres of habitat to the 1,350 acres of contiguous open space that follows Cross Creek west of SR 99.

The aquatic features and vegetation communities present onsite provide habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, Swainson's hawk, western burrowing owl, and San Joaquin kit fox. All of these species have been reported in the vicinity and have been reported or have the potential to be present on the Fagundes properties.

The Fagundes properties include opportunities for vernal pool restoration, enhancement, establishment, and preservation within the Upper Kaweah watershed. A desktop verification of a past wetland delineation of both parcels revealed 7.6 acres of vernal pools, 2.7 acres of wetland drainages (seasonal wetlands), and 14.7 acres of jurisdictional waters within the bed and bank of Cross Creek (Live Oak Associates 2001). Because vernal pools are already present on the Fagundes properties and soils are mapped as conducive for vernal pool formation, conditions are favorable for successful vernal pool establishment. The properties could support an additional 8.7 acres of vernal pools. A study of precipitation on the properties determined that it is sufficient to support the creation of vernal pools on the properties that would meet the USACE guidelines for ponding (i.e., at least 19 days a year in 5 of 10 years). Vernal pool creation and riparian restoration on the Fagundes properties would improve watershed conditions while providing habitat for special-status species.

5.4.2.8 Peck Island Properties

The Peck Island properties consist of 18 parcels in Fresno County (Appendix C, Peck Island Figures 1–4). The combined parcels are 414 acres and cover approximately three-quarters of the northeast portion of Peck Island contiguously. The properties consist of a combination of actively irrigated agricultural fields (207 acres) and ruderal habitat (41 acres) at the center of the island surrounded by natural oak woodland (35 acres) and riparian (125 acres) around the island's perimeter. Peck Island is an actual island within the Kings River alluvial fan, bounded by the main Kings River channel to the north and a combination of river braids to the south.

Within the Kings River alluvial fan, the Peck Island properties and the surrounding natural lands provide approximately 1,930 acres of contiguous open space between State Route 180 and E. Annadale Avenue suitable for special-status wildlife species. The riparian corridors throughout the properties support elderberry shrubs and the valley elderberry longhorn beetle and provide suitable nesting and foraging habitat for Swainson's hawk. Valley elderberry longhorn beetle and its elderberry shrub host plant have been reported onsite and have the potential to be more widespread on the island than originally reported.

An estimated 157 acres of riparian establishment, 1.5 acres of riparian restoration/enhancement, and 83.3 acres of oak woodland establishment, together with an estimated 135 acres of existing oak woodland and riparian habitat preservation, have been proposed on the Peck Island properties through preliminary conceptual restoration designs.

The preliminary designs involve reestablishing a historical ephemeral high-flow channel identified on the north end of the island to reconnect two existing side-channel braids as well as establishing two additional side-channel braids and three seasonal wetlands. The exact dimensions and locations of these side-channel braids (a total of approximately 4,000 linear feet) and seasonal wetlands (estimated total of 4 acres) would be developed in more detail on further evaluation of the site topography and groundwater table. The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands, oak woodland, and riparian habitat would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

5.4.2.9 Panorama Vista Preserve

The Panorama Vista Preserve properties consist of 60 parcels totaling 1,044 acres in Kern County (Appendix C, Panorama Vista Preserve Figures 1–4). The Panorama Vista Preserve properties are

owned by The Kern River Corridor Endowment and Holding Company, Inc., and sit on either side of the Kern River, north (upstream) of the city of Bakersfield. The habitats onsite include a combination of natural and disturbed lands composed of non-native annual grasslands, willow and saltbrush scrub, and cottonwood riparian forest. Together with portions of the natural land within the Kern River Oilfield and the Sierra Foothills, the Panorama Vista Preserve properties and the surrounding natural lands provide approximately 9,000 acres of contiguous open space between Bakersfield and the Sierra Foothills suitable for riverine restoration, wetland creation, and habitat preservation for special-status wildlife species.

The natural vegetation communities present onsite provide habitat suitable for valley elderberry longhorn beetle, blunt-nosed leopard lizard, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. These species have been reported in the vicinity and have been reported or have the potential to be present on the properties (see Appendix C).

The September 13, 2012, technical memorandum titled *Analysis of Wetland Restoration and Establishment Potential at Panorama Vista Preserve* (URS/HMM/Arup Joint Venture 2012b) states that the preliminary conceptual restoration designs currently under consideration involve establishing a seasonal wetland along the Kern River. Under the preliminary design, conceptual restoration involves establishing an approximately 10-acre backwater seasonal wetland and funding—and possibly implementing—future site restoration, enhancement, or reestablishment elsewhere in the preserve, in accordance with the preserve's 2009 *Conceptual Restoration Plan for the Panorama Vista Preserve, Bakersfield, Kern County, California* (River Partners 2009).

The exact acreages and locations of site restoration, enhancement, or reestablishment elsewhere in the preserve will be developed in more detail on further evaluation of the site topography and groundwater table and through close collaboration with the Panorama Vista Preserve. Feedback from preserve staff indicates that the preliminary conceptual restoration designs proposed to date are consistent with the goals and objectives of the preserve. These restoration efforts should improve watershed conditions and provide habitat and connectivity for special-status species.

5.4.2.10 River Ranch

The River Ranch property, which has been identified by Tulare Basin Wildlife Partners as a High Priority Project Concept,[4] involves property acquisition of a 362-acre working farm, including an island in the Kings River, for restoration through broadening the current floodplain and valley oak forest to provide flood control, groundwater recharge, and recreational opportunities (Tulare Basin Wildlife Partners 2012).

Development of this option as a potential mitigation property is still in the planning stages. PTE has been acquired and reconnaissance-level site visits have been performed. Preliminary conceptual design plans have been drafted and demonstrate the potential for restoration, enhancement, establishment, and preservation of oak woodlands, riparian, seasonal wetlands, and riverine habitat onsite. Additional work will be required to document existing site conditions (see the mitigation property prospectus) and prepare restoration design plans.

5.4.2.11 Smith Offering

The Smith Offering, which was identified as part of the Bureau of Land Management's Atwell Island Land Retirement Demonstration Project, consists of several large, non-contiguous parcels (approximately 2,793 acres) where land retirement and potential wetland and alkali sink habitat restoration could be attempted.

[4] Referred to as the "CalClark Farms 'River Ranch' Riparian Habitat Acquisition and restoration—HSR Phase 1 riparian-farmland mitigation recommendation."

Development of this option as a potential mitigation property is still in the planning stages. PTE has been requested, but no reconnaissance-level site visits, preliminary conceptual design plans, mitigation property prospectuses, or restoration design plans have been performed or developed.

5.4.2.12 Old River Dairy

The Old River Dairy properties are contiguous with the Buena Vista Dairy properties (described above) and consist of two adjacent parcels in Kern County currently under agricultural production. Through a review of historical aerial imagery and through comparison with the adjacent Buena Vista Dairy properties, the natural communities once present include alkali desert scrub, annual grassland, and a network of vernal pools and depressional wetlands. The parcels are bounded by I-5 to the west, Taft Highway 119/Old River Road to the north, and active agricultural land to the south and east. The parcels are just south of the Kern Water Bank.

Together with portions of the Kern Water Bank and the Buena Vista Dairy properties, the Old River Dairy properties and the surrounding natural lands provide approximately 5,000 acres of contiguous open space east of I-5 suitable for special-status wildlife species. If restoration were successfully undertaken to restore the site to its historical conditions, the development of natural vegetation communities could re-establish habitat suitable for blunt-nosed leopard lizard, Swainson's hawk, western burrowing owl, Nelson's antelope squirrel, Tipton kangaroo rat, and San Joaquin kit fox. All of these species have been reported in the vicinity and have been reported or have the potential to be present on the adjacent properties.

An estimated 161 to 295 acres of alkali rain pools may have been present on the Old River Dairy properties historically. The reestablishment of these historical wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC 8 watershed level and would provide improved habitat for special-status species.

5.4.3 Mitigation Alternatives Analysis

As described above, the permittee-responsible mitigation site analysis began with over 37,500 potentially suitable parcels, which were scored and ranked for either wildlife or aquatic resources. The parcels were scored to identify which sites were suitable for wildlife mitigation or for potential wetland restoration, enhancement, establishment, or preservation. A letter requesting permission to enter was mailed to the 500 property owners of the highest-scoring parcels (approximately 750 APNs). After this mailing effort, 141 landowners granted permission to enter their parcels. The windshield surveys, interviews with landowners and regional biologists, and/or reconnaissance-level site assessments conducted at these locations resulted in the identification of eight properties whose conservation values and existing conditions were determined to be suitable for wildlife mitigation and wetland restoration, enhancement, establishment, or preservation: the Yang, Staffel Family Trust, Valadez, Davis, Robertson, Te Velde, Buena Vista Dairy, and Panorama Vista Preserve properties.

Of these eight properties, five (the Yang, Staffel, Valadez, Davis, and Buena Vista Dairy properties) entailed predominantly preservation options, and the remaining three properties (the Robertson, Te Velde, and Panorama Vista Preserve properties) entailed extensive wetland restoration, enhancement, and establishment opportunities. However, on reviewing the title reports for each property, both the Robertson and Te Velde properties were removed from consideration due to the overwhelming financial encumbrances on these lands.

The 170-acre Burr Ranch property, identified through public outreach, was subsequently added as a mitigation alternative, but in late summer 2012 the Clark family sold the larger of the two parcels for agricultural land. Although much reduced in size, the remaining 40-acre parcel includes a documented Swainson's hawk nest and is still under consideration as a wildlife mitigation site.

An additional five properties (Fagundes, Peck Island, Old River Dairy, River Ranch, and the Smith Offering) have also been identified through a combination of public outreach and an adjacent parcel analysis undertaken to identify additional properties that border existing parcels currently under investigation.

In August 2012, CDFW notified the Authority about a pending law enforcement action within the boundaries of the Staffel properties, thereby suspending its candidacy for wildlife and wetlands mitigation (vernal pool preservation) pending the results of the investigation. The law enforcement action involved discing an estimated 2.5 to 5 acres of alkali desert scrub habitat where depressional wetlands have been mapped. In March 2013, CDFW notified the Authority that the law enforcement action had been concluded. The extent of wetland impacts at the Staffel property has not yet been determined; however, these disturbed aquatic resources could be restored or enhanced as part of future restoration efforts.

In November 2012, Zachary Simmons, USACE, contacted the Authority with suggested "candidate restoration sites in the Allensworth Area" based on the "wetland signatures... still present after years of agriculture" at several of these sites. In comparing these parcels to the prior mitigation site selection analysis, many of these parcels had been unsuccessfully queried during past permission-to-enter efforts. In the case of one parcel not previously identified in the permittee-responsible mitigation site selection analysis—the 551-acre Vanderpoel/Moita property—a desk-top analysis identified what appeared to be irrigated row crops on site. Historical aerial imagery indicated an estimated 124 acres of alkali rain pool may once have been present, suggesting opportunities for wetland reestablishment. However, reconnaissance-level surveys in January 2013 confirmed that the property had undergone a significant change in agricultural use since the historical aerial photographs were taken, from irrigated row crops to orchard. The land management practices associated with orchards (deep-ripping) and the associated costs of buying out a recently installed orchard are two factors that would make this site impractical for wetland restoration, enhancement, and establishment.

Project biologists are currently investigating the feasibility and practicability of alkali rain pool creation. This investigation will compare the existing conditions (i.e. soil chemistry and composition) at proposed alkali rain pool establishment sites such as Old River Dairy with similar sites such as the Yang and Buena Vista Dairy properties where alkali rain pools are present today, and the Bureau of Land Management's Atwell Island Land Retirement Demonstration Project where alkali rain pools appear to have reformed through natural processes after a period of disturbance.

The permittee-responsible mitigation site selection analysis consisted of a GIS analysis and visual analyses of the entire San Joaquin Valley floor to identify aquatic and wildlife resource mitigation sites that appeared to retain natural habitat and/or jurisdictional water features for analysis. However, in the course of this analysis, several properties were removed from further consideration based on a number of factors, including limitations on permission to enter, mineral rights, financial restrictions, property owner decisions not to sell, or unsuitable land usage.

Acquisition of a permittee-responsible mitigation site requires willing landowners interested in participating in the process through fee-title sale or establishment of a conservation easement on privately owned land. Unlike the right-of-way process, a government agency cannot use "eminent domain" to obtain land for a mitigation site. Therefore, a non-response by the landowner to a request for permission to enter is equivalent to a negative response. The many non-responses to the request for permission to enter and the negative responses served to limit the pool of potential sites available for consideration.

Title reports were obtained for the properties where permission to enter was granted and the mitigation site selection analysis supported a decision to proceed. A review of the title reports

identified if the property was owned by multiple partners, if the subsurface mineral rights were intact or severed, and if any financial restrictions or encumbrances (liens, holds, etc.) were in place. Communications with CDFW staff indicated that properties that had severed the surface and mineral rights would not be suitable as a permittee-responsible mitigation site and were therefore removed from further consideration. Properties whose title reports indicated that there were overwhelming financial restrictions or encumbrances were also removed from further consideration.

In some cases, landowners had a disincentive to sell the title or easements to parcels that provide access to rivers and streams where jurisdictional waters and wetland restoration, enhancement, establishment, or preservation could be accomplished because these properties secure the water rights necessary to the landowner's ranching or farming operations.

In other cases, landowners had a disincentive because of environmental regulations or economics. For example, some dairy operations are currently under cultivation for alfalfa, a strategic cover crop necessary in the valley floor to facilitate the legal disposal of solid and liquid dairy effluent in compliance with State Water Resources Control Board regulations and the Clean Water Act. Economically, the development of new orchards (for pistachios, almonds, etc.) requires a significant capital outlay, and some landowners may not be able to recover the cost incurred through loans and obligations in a fee-title sale or conservation easement.

Certain agricultural land management practices also preclude wetland and wildlife restoration, enhancement, establishment, and preservation opportunities because of land uses/land conversions that are incompatible with proposed restoration needs. For example, deep-ripping of the soil for orchards could puncture or remove intact claypan/hardpan layers necessary for seasonal wetland and vernal pool formation. CDFW staff have communicated that other practices, such as the application or use of fertilizers, growth hormones, and/or pesticides/herbicides may in some cases infiltrate into "first encounter groundwater" and lead to changes in soil chemistry, pollution, or ground sterilization.

5.4.4 Recommended Mitigation Options: Jurisdictional Waters

The USACE recommends mitigation of jurisdictional waters using a watershed approach to the extent appropriate and practicable. The ultimate goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites (70 FR 19691). Where feasible, using this watershed approach is sensible guidance for mitigation of in-kind wetlands and will be used wherever possible. However, where watersheds have been highly modified and potential mitigation sites are small and highly fragmented, as many are in the San Joaquin Valley, the function and value of wetlands may better be represented if sites are chosen on the basis of quality, location, size, and connectivity – even if this means mitigating outside of a given watershed.

For example, to mitigate for impacts on seasonal wetlands along the Fresno to Bakersfield Section of the HST System, greater function and value of may be achieved through offsite mitigation by restoring, creating, or enhancing wetlands in the vicinity of the impacts but with less regard to strict watershed boundaries. Some of the wetland impact may include mitigation for jurisdictional waters outside of watershed boundaries, but within a particular region, i.e. mitigation credits may be lumped to include the region north or south of the Kings River. In all cases, the Authority/FRA will weigh the watershed approach with other factors to evaluate the best choices for mitigation sites. Where possible, management of these properties will adhere to recommendations given in watershed plans, such as the Water Quality Control Plan for the Tulare Lake Basin (CVRWQCB 2004).

Because no USACE-approved in-lieu programs are currently available in the San Joaquin Valley, in-lieu fees will not be pursued as compensation for jurisdictional waters.

Table 5-4 provides a summary of watershed resources found on the potential mitigation sites.

5.4.5 Recommended Mitigation Options: Plants/Wildlife Species

The USFWS and CDFW recommend mitigation of special-status wildlife species to offset any permanent, harmful impacts the proposed activity might have on federally- and state-listed species through the preservation of existing habitat rather than habitat creation. Where feasible, Habitat preservation will be used wherever possible through the use of conservation banks, fee-title acquisition, and conservation easements. However, in-lieu fees will not be pursued as compensation for state-listed species.

Mitigation sites will be chosen on the basis of quality, location, size, connectivity, and other factors that contribute to their ecological value in the landscape of the Central Valley. Where possible, mitigation sites that provide “layered” or “nested” mitigation opportunities to protect more than one species will be prioritized over sites that provide mitigation for individual species since the presence of multiple special-status species is one indicator of habitat quality. In all cases, the Authority/FRA will consider several factors in the mitigation site selection process to evaluate the best choices for mitigation sites. A summary of the wildlife resources found on the potential mitigation sites is given in Table 5-5.

5.5 Mitigation Obligation and Schedule Options

Mitigation obligations are generally met prior to issuance of Section 404, Section 401, and CDFW Section 2081 permits. Because of the project construction schedule and the limited time available to identify, acquire, design, and obtain agency approval for mitigation sites, the construction phase for restoration/creation mitigation sites is not likely to be completed prior to permit issuance. At a minimum, protection of compensatory mitigation sites through binding instruments should be in place prior to construction or ground-disturbing activities that may affect jurisdictional resources. A final compensatory mitigation plan will be submitted for approval prior to permit issuance.

Table 5-4
Overview of Potential Mitigation Property Resources: Potential Acreage Available

Resource Type	Buena Vista Dairy (715 acres)	Yang Properties (316.4 acres)	Staffel Family Trust Property (61.2 acres)	Davis Property (158 acres)	Valadez Property (120 acres)	Burr Ranch (40 acres)	Fagundes Properties (405 acres)	Peck Island Properties (414 acres)	Panorama Vista Preserve (1,044 acres)	Old River Dairy (750.8 acres)	River Ranch (362 acres)	Smith Offering (2,793 acres)
Wetlands												
Alkali rain pool (reestablishment)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	161 - 295 ac	N/A	TBD
Vernal pool (reestablishment)	N/A	N/A	N/A	N/A	N/A	N/A	8.7 ac	N/A	N/A	N/A	N/A	TBD
Vernal pool (preservation)	83.7	97.7 ac	2.8 ac	28.3 ac	0.2 ac	N/A	7.6 ac	N/A	N/A	N/A	N/A	TBD
Seasonal wetland (reestablishment)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4 ac	10 ac	N/A	N/A	TBD
Seasonal wetland (preservation)	33.6 ac	N/A	0.1 ac	4.1 ac	0.8 ac	N/A	2.7 ac	N/A	N/A	N/A	N/A	TBD
Riverine (reestablishment)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3 ac	N/A	N/A	4.3 ac	TBD
Riverine (preservation)	N/A	N/A	N/A	N/A	N/A	N/A	14.7 ac	31.7 ac	17.4 ac	N/A	28.8 ac	TBD
Uplands												
Oak woodland (reestablishment)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	83.3 ac	N/A	N/A	182.4 ac	TBD
Oak woodland (preservation)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35 ac	N/A	N/A	3.1 ac	TBD
Riparian (establishment)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	157 ac	45.5 ac	N/A	87.9 ac	TBD
Riparian (restoration/enhancement)	N/A	N/A	N/A	N/A	N/A	N/A	5.6 ac	1.5 ac	118.2 ac	N/A	34.9 ac	TBD
Riparian (preservation)	N/A	N/A	N/A	N/A	N/A	N/A	TBD	100 ac	33.5 ac	N/A	9.3 ac	TBD
Wildlife												
Vernal pool fairy shrimp	N/A	97.7 ac	2.9 ac	32.4 ac	1.0 ac	N/A	10.3 ac	N/A	N/A	N/A	N/A	N/A
Vernal pool tadpole shrimp	N/A	97.7 ac	2.9 ac	N/A	N/A	N/A	10.3 ac	N/A	N/A	N/A	N/A	N/A
California tiger salamander (aquatic)	N/A	N/A	N/A	N/A	N/A	N/A	10.3 ac	N/A	N/A	N/A	N/A	N/A
California tiger salamander (upland)	N/A	N/A	N/A	N/A	N/A	N/A	365.7 ac	N/A	N/A	N/A	N/A	N/A
Blunt-nosed leopard lizard	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	N/A	N/A	N/A	1,044 ac	750.8 ac	N/A	TBD
Swainson's hawk	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	40 ac	405 ac	414 ac	N/A	750.8 ac	317 ac	TBD
Western burrowing owl	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	40 ac	384.7 ac	N/A	1,044 ac	750.8 ac	N/A	TBD
Nelson's antelope squirrel	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	N/A	N/A	N/A	1,044 ac	750.8 ac	N/A	TBD
Tipton kangaroo rat	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	N/A	N/A	N/A	1,044 ac	750.8 ac	N/A	TBD
San Joaquin kit fox	715 ac	316.4 ac	61.2 ac	158 ac	120 ac	N/A	384.7 ac	N/A	1,044 ac	750.8 ac	N/A	TBD

ac = acre(s)
lf = linear feet
N/A = not applicable (not present)
TBD = to be determined

Table 5-5
Overview of Potential Mitigation Property Resources: Presence of Wildlife Species

Resource Type	Buena Vista Dairy (715 acres)	Yang Properties (316.4 acres)	Staffel Family Trust Property (61.2 acres)	Davis Property (158 acres)	Valadez Property (120 acres)	Burr Ranch (40 acres)	Fagundes Properties (405 ac)	Peck Island Properties (414 ac)	Panorama Vista Preserve (1,044 ac)	Old River Dairy (750.8 ac)	River Ranch (362 ac)	Smith Offering (2,793 ac)
Vernal pool fairy shrimp	Ø	S	S	S	S	Ø	AP or S	Ø	Ø	Ø	Ø	Ø
Vernal pool tadpole shrimp	Ø	S	S	Ø	Ø	Ø	AP or S	Ø	Ø	Ø	Ø	Ø
California tiger salamander	Ø	Ø	Ø	Ø	Ø	Ø	AP or S	Ø	Ø	Ø	Ø	Ø
Blunt-nosed leopard lizard	S*	P	P	S*	S*	Ø	Ø	Ø	AP or S	R	Ø	R
Swainson's hawk	S	C (f)	C (f)	C (f)	C (f/n)	P (f/n)	C (f/n)	AP (n)	Ø	R	S	R
Western burrowing owl	P	P	P	P	AP	Ø	P	Ø	S	R	Ø	R
Nelson's antelope squirrel	S*	S*	S*	S*	S*	Ø	Ø	Ø	S	R	Ø	R
Tipton kangaroo rat	P	C*	C*	C	C*	Ø	Ø	Ø	AP or S	R	Ø	R
San Joaquin kit fox	S*	C*	C*	S*	C*	Ø	S	Ø	AP or S	R	Ø	R

C = CDFW confirmed present
P = present
Ø = absent
AP = assume presence
S = survey
R = acreage TBD pending site restoration/establishment
* = identified as highly suitable for this species by Dr. Brian Cypher (ESRP)
f = foraging habitat
n = nesting habitat

Section 6.0

Mitigation Plans and Assurances

6.0 Mitigation Plans and Assurances

Final permits will require a final Compensatory Mitigation Plan that sets forth specifications for several plans and assurances, including site-specific mitigation work plans, maintenance plans, performance standards/success criteria, contingency planning, performance monitoring requirements, and long-term management plans as well as financial assurances. All or most of these plans are required for restoration/creation mitigation sites; preservation-only mitigation sites generally require only long-term management plans and financial assurances. These components have been developed early in the conceptual mitigation planning process (Draft Compensatory Mitigation Plan) and, as compensatory mitigation opportunities are identified, will be fleshed out in more detail for the Final Compensatory Mitigation Plan. The details of these plans and assurances are described in more detail below. A final Compensatory Mitigation Plan(s) that includes a mitigation work plan, interim maintenance plans, performance standards/success criteria, monitoring requirements, long-term management plans, adaptive management plans, and financial assurances will be developed for each site, and will correspond with project phasing, if necessary.

6.1 Mitigation Work Plan

For restoration/creation mitigation sites, a mitigation work plan will be prepared for the compensatory mitigation project(s) that will include the following:

- Detailed written specifications and work descriptions including, but not limited to, the geographic boundaries of the project.
- Construction methods, timing, and sequence.
- Source(s) of water, plants, and/or wildlife.
- Connectivity to existing waters, vegetation communities, wildlife movement corridors, natural/protected lands.
- Methods for establishing the desired plant/wildlife community.
- Wildlife translocation methodology; plans to control invasive plant/wildlife species.
- The proposed grading plan, including elevations and slopes of the substrate.
- Soil management.
- Erosion control measures, as appropriate.

For stream compensatory mitigation projects, the mitigation work plan may also include other relevant information, such as plan form geometry, channel form (e.g., typical channel cross sections), watershed size, design discharge, and riparian area plantings.

6.2 Interim Maintenance Plan

An interim maintenance plan will be prepared for a restoration/creation compensatory mitigation project that will include a description and schedule of maintenance requirements to ensure the continued viability of the resource(s) once initial construction is completed. The maintenance plan would be tailored to site-specific needs, including fencing, invasive species removal, grazing, etc.

6.3 Performance Standards/Success Criteria

Ecologically based performance standards will be specified to measure whether a restoration/creation mitigation project is achieving its objectives. The performance standards will relate to the objectives of the compensatory mitigation project so that the project can be objectively evaluated to determine if it is developing into the desired resource type, providing the expected functions, supporting or sustaining the appropriate plant/wildlife species, and attaining any other applicable metrics (e.g., acres).

Performance standards will be based on attributes that are objective and verifiable (e.g., a Level 2 rapid assessment for jurisdictional waters) or as determined through consultation with agency staff. Ecological performance standards will be based on the best available science to establish levels and quantities that can be measured or assessed in a practicable manner. Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, plant and wildlife species presence/absence, and/or comparisons to reference resources of similar type and landscape position. The use of reference resources to establish performance standards will help ensure that those performance standards are reasonably achievable by reflecting the range of variability the regional class of resources exhibits as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology, for example, should take into consideration the hydrologic variability that the reference aquatic resources exhibit, especially wetlands. Where practicable, performance standards should take into account the expected stages of the resource development process to allow early identification of potential problems and appropriate adaptive management.

6.4 Monitoring Requirements

Monitoring the restoration/creation compensatory mitigation project site(s) is necessary to determine if the project is meeting its performance standards, and to determine if measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. Monitoring reports will be required, which assess the development and condition of the compensatory mitigation project at a level commensurate with the compensatory mitigation project type, will be submitted to the responsible agencies.

Site-specific monitoring requirements for restoration/creation compensatory mitigation projects will be specified and will include the parameters to be monitored, the length of the monitoring period, the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the responsible agencies, and the party responsible for submitting those monitoring reports to the responsible agencies.

A monitoring period sufficient to demonstrate that the compensatory mitigation project has met performance standards (i.e., not less than 5 years) will also be specified. A longer monitoring period will be required for aquatic resources with slow development rates (e.g., forested wetlands, alkali rain pools) until the performance standards have been met for three consecutive years without human intervention, but not less than five years. After the project is implemented, the responsible agencies may reduce or waive the remaining monitoring requirements upon a determination that the compensatory mitigation project has achieved its performance standards. Conversely, the responsible agencies may extend the original monitoring period upon a determination that performance standards have not been met or the compensatory mitigation project is not on track to meet them. The responsible agencies may also revise monitoring requirements when remediation and/or adaptive management is required.

The Authority/FRA will coordinate with the responsible agencies to determine the information to be included in the monitoring reports. The monitoring reports will include information sufficient for the responsible agencies to determine how the compensatory mitigation project is progressing toward meeting its performance standards, and may include plans (such as as-built plans), maps, and photographs to illustrate site conditions. Monitoring reports may also include the results of functional, condition, or other assessments used to provide quantitative or qualitative measures of the functions provided by the compensatory mitigation project site.

6.5 Long-Term Management Plan

All mitigation projects (restoration/creation sites and preservation-only sites) will be designed to ensure the long-term sustainability of the resources through the preparation and implementation of a long-term management plan that identifies the long-term financing mechanisms and the party responsible for long-term management.

The permit conditions or instrument will identify the party responsible for ownership and all long-term management of the compensatory mitigation project. The permit conditions or instrument may contain provisions allowing the permittee or sponsor to transfer the long-term management responsibilities of the compensatory mitigation project site to a land stewardship entity, such as a public agency, non-governmental organization, or private land manager, after review and approval by the responsible agencies. The land stewardship entity need not be identified in the original permit or instrument, as long as the future transfer of long-term management responsibility is approved by the responsible agencies.

The long-term management plan will describe long-term management needs, annual cost estimates for these needs, and identify the funding mechanism that will be used to meet those needs. Any provisions necessary for long-term financing must be addressed in the original permit or instrument. The responsible agencies may require provisions to address inflationary adjustments and other contingencies, as appropriate.

Appropriate long-term financing mechanisms include non-wasting endowments, trusts, contractual arrangements with future responsible parties, and other appropriate financial instruments. In cases where the long-term management entity is a public authority or government agency, that entity must provide a plan for the long-term financing of the site. For permittee-responsible mitigation, any long-term financing mechanisms must be approved in advance of the activity causing the authorized impacts.

The resources and buffers that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. Long-term protection may be provided through real estate instruments such as conservation easements held by entities such as federal, tribal, state, or local resource agencies, non-profit conservation organizations, or private land managers; the transfer of title to such entities; or by restrictive covenants.

For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans. When approving a method for long-term protection of non-government property other than transfer of title, the responsible agencies shall consider relevant legal constraints on the use of conservation easements and/or restrictive covenants in determining whether such mechanisms provide sufficient site protection.

The real estate instrument, management plan, or other mechanism providing long-term protection of the compensatory mitigation site must, to the extent appropriate and practicable, prohibit incompatible uses (e.g., clear cutting or mineral extraction) that might otherwise jeopardize the objectives of the compensatory mitigation project. Where appropriate, multiple instruments recognizing compatible uses (e.g., fishing or grazing rights) may be used.

The real estate instrument, management plan, or other long-term protection mechanism must contain a provision requiring 60-day advance notification to the responsible agencies before any action is taken to void or modify the instrument, management plan, or long-term protection mechanism, including transfer of title to, or establishment of any other legal claims over, the compensatory mitigation site.

For compensatory mitigation projects on public lands, where federal facility management plans or integrated natural resources management plans are used to provide long-term protection, and changes in statute, regulation, or agency needs or mission results in an incompatible use on public lands originally set aside for compensatory mitigation, the public agency authorizing the incompatible use is responsible for providing alternative compensatory mitigation that is acceptable to the responsible agencies for any loss in functions resulting from the incompatible use.

A real estate instrument, management plan, or other long-term protection mechanism used for site protection of permittee-responsible mitigation must be approved by the responsible agencies in advance of, or concurrent with, the activity causing the authorized impacts.

Compensatory mitigation projects shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. This includes minimization of active engineering features (e.g., pumps) and appropriate siting to ensure that natural hydrology and landscape context will support long-term sustainability.

Where active long-term management and maintenance are necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party must provide for such management and maintenance. This includes the provision of long-term financing mechanisms where necessary. Where needed, the acquisition and protection of water rights must be secured and documented in the permit conditions or instrument.

6.6 Adaptive Management Plan

The compensatory mitigation project will be designed to address unforeseen changes in site conditions or other of its components, including the party or parties responsible for implementing adaptive management measures, through the preparation and implementation of an adaptive management plan. This plan will serve to guide decisions for revising compensatory mitigation plans and implementing measures that adversely affect compensatory mitigation success. The plan will accommodate changing conditions, incorporate new data or technologies, or better methods.

If the restoration/establishment compensatory mitigation project cannot be constructed in accordance with the approved mitigation plans, the permittee or sponsor must notify the responsible agencies. Those agencies must approve a significant modification of the compensatory mitigation project. If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party must notify the responsible agencies as soon as possible. The responsible agencies will evaluate and pursue measures to address deficiencies in the compensatory mitigation project. Those agencies will consider whether the compensatory mitigation project is providing ecological benefits comparable to the original objectives of the compensatory mitigation project.

The responsible agencies, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), will determine the appropriate measures to be applied when a mitigation project is not meeting objectives. The measures may include site modifications, design changes, revisions to maintenance requirements, and revised monitoring requirements. The measures must be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.

Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters.

6.7 Financial Assurances

Agency-approved fiscal assurances provide a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standards.

In cases where an alternate mechanism is available to ensure a high level of confidence that the compensatory mitigation will be provided and maintained (e.g., a formal, documented commitment from a government agency or public authority), the responsible agencies may determine that financial assurances are not necessary for that compensatory mitigation project.

The amount of the required financial assurances must be determined by the responsible agencies, in consultation with the project sponsor, and must be based on the size and complexity of the compensatory mitigation project, the degree of completion of the project at the time of project approval, the likelihood of success, the past performance of the project sponsor, and any other factors the responsible agencies deems appropriate. Financial assurances may be in the form of performance bonds, escrow accounts, casualty insurance, letters of credit, legislative appropriations for government-sponsored projects, or other appropriate instruments, subject to the approval of the responsible agencies. The rationale for determining the amount of the required financial assurances must be documented in the administrative record for either the Department of the Army permit or the instrument. In determining the assurance amount, the responsible agencies shall consider the cost of providing replacement mitigation, including costs for land acquisition, planning and engineering, legal fees, mobilization, construction, and monitoring.

If financial assurances are required, the permit must include a special condition requiring the financial assurances to be in place before the permitted activity begins.

Financial assurances shall be phased out once the compensatory mitigation project has been determined by the responsible agencies to be successful in accordance with its performance standards. The permit or instrument must clearly specify the conditions under which the financial assurances are to be released to the permittee, sponsor, and/or other financial assurance provider, including, as appropriate, linkage to achievement of performance standards, adaptive management, or compliance with special conditions.

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Section 7.0

Overview of Mitigation Implementation

7.0 Overview of Mitigation Implementation

Because of the large geographic region and impacts on various species and habitats, offsite compensatory mitigation will likely include a combination of mitigation/conservation banks, in-lieu fee programs, and permittee-responsible mitigation. In light of agency preferences, any available, approved existing bank credits will be purchased as a first step to meeting compensatory mitigation goals. A limited number of available mitigation and conservation bank credits in the appropriate service area have been identified; URS biologists are consulting with agencies and mitigation banking firms to secure and purchase credits.

Additional mitigation requirements will be fulfilled by in-lieu fee programs where applicable, approved, and available. Permittee-responsible mitigation banks will fulfill any remaining mitigation requirements.

7.1 Goals

Compensatory mitigation goals include:

- Offsetting permanent losses of waters of the U.S.
- Using a watershed approach.
- Creating, restoring, and enhancing waters of the U.S and aquatic resources.
- Preserving and restoring habitat for special-status species.
- Meeting or exceeding mitigation ratio estimates for compensation to wetlands and special-status wildlife and plants.

All compensatory mitigation will be sought with agency oversight; only mitigation projects and programs with agency approval will be used to fulfill goals. Once mitigation/conservation bank credits are secured, in-lieu fee programs are identified, and permittee-responsible mitigation sites are identified and procured, this section will include a table summarizing the mitigation acreages needed and how each compensatory mitigation option contributes to the final estimate.

7.2 Implementation and Mitigation Responsibilities

For all permittee-responsible mitigation, the Authority will ensure that each mitigation site has appropriate mitigation and monitoring plans in place. Funding shall be secured for initial restoration, if applicable, and continued monitoring. All plans will be based on adaptive management: plans will be re-written to accommodate changing conditions, incorporate new data or technologies, or better methods.

7.3 Mitigation Summary

On final completion of this Compensatory Mitigation Plan, this section will provide a discussion outlining the compensatory mitigation requirements and a full accounting of how these requirements have been met through mitigation/conservation banking, in-lieu fees, conservation easements, and fee-title acquisitions.

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Section 8.0
List of Preparers

8.0 List of Preparers

This section summarizes the URS/HMM/Arup Joint Venture employees, and provides a summary of their qualifications, roles, and responsibilities in the preparation of this Compensatory Mitigation Plan.

Justin Whitfield
Project Ecologist

B.S., Biological Sciences, Florida State University. 10 years of experience in biological assessments and preparation of environmental documents.

- Fresno to Bakersfield Biology Task Manager
- Organized and planned report preparation.
- Conducted Internal Technical Review.

Matthew Bettelheim
Senior Wildlife Biologist

B.S., Ecology, Behavior, and Evolution, University of California-San Diego. 10 years of experience in environmental impact assessments, special-status species surveys, construction monitoring, and herpetology.

- Compensatory Mitigation Plan Subtask Manager.
- Prepared and reviewed mitigation data and text.
- Developed and reviewed mitigation site selection analysis.

Tammy Lim
Senior Biologist

M.A. Ecology and Systematic Biology, San Francisco State University, San Francisco. 12 years of experience in herpetology, ornithology, field biology and special-status species surveys.

- Developed and reviewed mitigation site selection analysis.
- Prepared and reviewed mitigation data and text.
- Developed and reviewed mitigation site selection analysis.

Jessie Golding
Wildlife Biologist

B.A., Integrative Biology, University of California-Berkeley; B.A., Environmental Earth Science, University of California-Berkeley.
4 years of experience in environmental impact analysis, federal ESA consultation, and habitat assessments.

- Prepared and reviewed mitigation data and text.
- Developed and reviewed mitigation site selection analysis.

Andrea Coleman
Wildlife Biologist

B.S., Biology, University of California-Los Angeles. 3 years of experience in biological research studies, 2 in environmental consulting, including environmental impact analysis, preparation of environmental documents, and special-status species surveys.

- Prepared and reviewed mitigation data and text.
- Developed and reviewed mitigation site selection analysis.

GIS

Rose Abbors, Senior GIS Analyst	B.S., Geography, Arizona State University. Six years of experience with environmental land use mapping and impact analysis. Cartographic design, basic database creation, as well project management. • Oversaw habitat mapping effort and performed impact calculations. • Reviewed and assisted with maps and data production.
Tomas Lopes Senior GIS Analyst	B.A., Physical Science, San Francisco State University. 7 years of experience in geospatial technologies including; GIS analysis, data transformation, workflow automation, and map portal development. • Prepared proximity analysis for biological habitats. • Created thematic overlays representing biological habitats. • Reviewed and assisted with maps and data production.

Editing

Deb Fournier Senior Word Processing Technician	12 years of experience creating, formatting, and processing word processing requests. • Formatted and prepared document for reproduction.
Dennis Rowcliffe Senior Technical Editor	B.A., American Studies and Journalism, California State University-Los Angeles. 22 years of experience conducting a variety of technical editing, document coordination and document production duties. • Senior Technical Editor.

Section 9.0
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Appendix A
Review Criteria for Section 7 Offsite Compensation

Sacramento Fish and Wildlife Office
Review Criteria for Section 7 Off-Site Compensation
Revised July 28, 2011

Property Assurances and Conservation Easement

☐ Title Report (preliminary at proposal, and Final Title Insurance at recordation), shall be no older than six months;

☐ Property Assessment and Warranty;

☐ Subordination Agreement **[if there is any outstanding debt on the property]**;

☐ Legal Description and Parcel Map;

☐ Conservation Easement (should use the current SFWO standardized CE template); or

☐ Non-Template Conservation Easement;

Site Assessment and Development

☐ Phase I Environmental Site Assessment;

☐ Restoration or Habitat Development Plan;

☐ Construction Security ***[if applicable]***;

☐ Performance Security ***[if applicable]***;

Site Management

☐ Interim Management Plan;

☐ Interim Management Security Analysis and Schedule;

☐ Long-Term Management Plan;

☐ Endowment Fund Analysis and Schedule;

☐ Endowment Funding Agreement or Trust Agreement or Declaration of Trust

**Guidelines to assist in understanding what is required are detailed on pages 2–7.

Guidelines

Real Estate Assurances and Conservation Easement (CE)

Title Report

1. Who holds fee title to property? Should be the Project Applicant. If not, there may be liability and contracting issues.
2. Are there any liens or encumbrances (existing debts or easements) on the property?
   a. Review Preliminary Title Report to evaluate liens and encumbrances (see Property Assessment and Warranty, below).
   b. Could any of these liens or encumbrances potentially interfere with either biological habitat values or ownership? If existing easements can potentially interfere with the conservation values/habitat of the property, those portions of the land should be deducted from the total compensation acreage available on the site.

Property Assessment and Warranty

1. Property owner should submit a Property Assessment and Warranty, which discusses every exception listed on the Preliminary Title Report and Final Title Insurance Policy, evaluating any potential impacts to the conservation values that could result from the exceptions (see below).
2. The Property Assessment and Warranty should include a summary and full explanation of all exceptions remaining on the title, with a statement that the owner/Grantor accepts responsibility for all lands being placed under the CE as available for the primary purposes of the easement, as stated in the easement, and assures that these lands have a free and clear title and are available to be placed under the CE.

Subordination Agreement

1. A Subordination Agreement is necessary if there is any outstanding debt on the property. Review Subordination Agreement language for adequacy—the lending bank or other lien holder must agree to fully subordinate each lien or encumbrance under the CE.

Legal Description and Parcel Map

1. Ensure accuracy of map, and location and acreage protected under the CE.
2. Both the map and the legal description should explain the boundaries of the individual project compensation site. The site should *not* have 'leftover' areas for later use.
3. Ask for an easement map to be prepared (if applicable), showing all easements on the property.

Conservation Easement from Template

1. Who will hold the easement?

a. Must have third-party oversight by a qualified non-profit or government agency. Qualifications include:
   i. Organized under IRS 501(c)(3);
   ii. Qualified under CA Civil Code § 815;
   iii. Bylaws, Articles of Incorporation, and biographies of Board of Directors on file at, and approved, by SFWO.
      1. Must meet requirements of SFWO, including 51% disinterested parties on the Board of Directors;
b. Must be accredited by the Land Trust Accreditation Commission http://www.landtrustaccreditation.org/home.

2. Project Applicant should submit a redline version showing all of their proposed revisions in track changes, along with an explanation of all deviations from the template

Non-Template Conservation Easement

1. If not using the CE template, the Project Applicant should specify objections they have to the template. This may substantially delay processing as the non-template CE will require review by the Solicitor's Office. Alternate CEs must be approved by the SFWO prior to recording.
2. The Project Applicant must either 1) add SFWO as a third-party beneficiary, or 2) add language throughout the document, in all appropriate places, that will assure SFWO the right to enforce, inspect, and approve any and all uses and/or changes under the CE prior to occurrence (including land use, biological management or ownership).
3. Include, at a minimum, language to:
   a. Reserve all mineral, air, and water rights under the CE as necessary to maintain and operate the site in perpetuity;
   b. Ensure all future development rights are forfeited;
   c. Ensure all prohibited uses contained in the CE template are addressed; and
   d. Link the CE, Management Plan, and the Endowment Trust Fund within the document (e.g., note that each exists to support the others, and where each of the documents can be located if a copy is required).
4. Insert necessary language, particularly, but not exclusively, per: (can compare to CE template)
   a. Rights of Grantee
   b. Grantee's Duties
   c. Reserved Rights
   d. Enforcement
   e. Remedies
   f. Access
   g. Costs and Liabilities
   h. Assignment and Transfer
   i. Merger
   j. Notices

Site Assessment and Development

Phase I Environmental Site Assessment

1. The Phase I ESA must show that the compensation site is not subject to any recognized environmental conditions as defined by the American Society for Testing and Materials (ASTM) Standard E1527-05 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, available at http://www.astm.org/Standards/E1527.htm, (i.e., the presence or likely presence of any Hazardous Substances or petroleum products).
2. If the Phase I ESA identifies any recognized environmental conditions, the Project Applicant must represent and warrant to the SFWO that all appropriate assessment, clean-up, remediation, or removal action has been completed.
3. Phase II ESA may be required to investigate subsurface conditions.

Restoration or Habitat Development Plan *[not required if doing preservation only]*

1. The overall plan governing construction and habitat establishment activities required to be conducted on the Property, including, without limitation, creation, restoration, and enhancement of habitat.
   a. This plan should include the baseline conditions of the Property including biological resources, geographic location and features, topography, hydrology, vegetation, past, present, and adjacent land uses, species and habitats occurring on the property, a description of the activities and methodologies for creating, restoring, or enhancing habitat types, a map of the approved modifications, overall habitat establishment goals, objectives and Performance Standards, monitoring methodologies required to evaluate and meet the Performance Standards, an approved schedule for reporting monitoring results, a discussion of possible remedial actions, and any other information deemed necessary by the SFWO.
2. Any permits and other authorizations needed to construct and maintain the site shall be included and in place prior to the start of construction of the habitat.
3. Full construction plans for any habitat construction must be *SFWO-approved prior* to the start of construction of the habitat.

Construction Security

1. The Project Applicant shall furnish a Construction Security in the amount of 100% of a reasonable third party estimate or contract to create, restore, or enhance habitats on the property in accordance with the Restoration or Habitat Development Plan.
2. Construction Security can be drawn on should the project proponent default.
3. The Construction Security shall be in the form of an irrevocable standby letter of credit or a cashier's check.
   a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically

extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Construction Security shall be in favor of a third party approved by the SFWO.
   c. Language in a draft letter of credit to be approved by the SFWO.

Performance Security *[only necessary if habitat is being restored, enhanced, or constructed]*

1. The Project Applicant shall furnish a Performance Security in the amount of 20% of the Construction Security.
2. Performance Security can be drawn on should the Performance Standards not be met, if remedial action becomes necessary.
3. The Performance Security shall be in the form of an irrevocable standby letter of credit or a cashier's check.
   a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Construction Security shall be in favor of a third party approved by the SFWO.
   c. Language in a draft letter of credit to be approved by the SFWO.

Site Management

Interim Management Plan

1. The Interim Management Plan should identify the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the Endowment Fund has been fully funded for one year and all the Performance Standards in the Development Plan have been met. This may be the same as the Long-term Management Plan.

Interim Management Security Analysis and Schedule

The purpose of the Interim Management Security is to allow the endowment to grow for at least one year without any disbursements, and is a safeguard to ensure that there will be enough funds in the endowment to pay for future management costs. The period can be longer than one year, and is often 3 years for Conservation Banks. Many endowments have recently experienced losses in principal.

1. The Project Applicant shall furnish an Interim Management Security (in the form of a standby letter of credit) in the amount equal to the estimated cost to implement the Interim Management Plan during the first year of the Interim Management Period, as set for in the Interim Management Security Analysis and Schedule.
2. The Interim Management Security Analysis and Schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency,

timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Interim Management Plan. The total annual expenses should include administration and contingency costs.

3. The Interim Management Security must:
    a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
    b. Be held according to minimum standards for assuring maximum success in earning potential, and will assurances for no loss of principle.
    c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

Long-Term Management Plan (LTMP)

1. The LTMP template identifies the long-term management, monitoring and reporting activities to be conducted.
2. The LTMP should include at minimum:
    a. Purpose of the Project and purpose of the LTMP;
    b. A baseline description of the setting, location, history, and types of land use activities, geology, soils, climate, hydrology, habitats present (once project meets Performance Standards), and species descriptions;
    c. Overall management, maintenance and monitoring goals; specific tasks and timing of implementation; and discussion of any constraints, which may affect goals;
    d. The Endowment Fund Analysis and Schedule (see below);
    e. Discussion of Adaptive Management actions for reasonably foreseeable events and possible thresholds for evaluating and implementing Adaptive Management;
    f. Rights of access to the Property and prohibited uses of the Property as provided in the CE; and
    g. Procedures for Property transfer, land manager replacement, amendments, and notices.
3. The LTMP must be incorporated by reference in the CE.
4. The LTMP is considered a living document and may be revised as necessary upon agreement of the land manager, easement holder, and SFWO.

Endowment Fund Analysis and Schedule

1. Can use a PAR or PAR-like analysis and must be based upon the final, approved LTMP.
    a. The analysis should be reviewed by the land manager.
2. The analysis and schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Management Plan. The total annual expenses should include administration and contingency costs (contingency

can be included on each line item). Unless there is a separate endowment for the purpose of monitoring and reporting on the CE conditions, then, the analysis should also include costs of

- Monitoring and reporting CE conditions;
- Defending the CE; and
- Liability insurance.

3. The Endowment Fund must:
   a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
   b. Be held according to minimum standards for assuring maximum success in earning potential, and will include assurances for no loss of principle.
   c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

<u>Endowment Funding Agreement</u>

1. This is the agreement between the endowment holder and the Project Applicant, as to how the endowment is to be funded, held and disbursed;
2. USFWS is not signatory to this agreement, but should be made a third-party beneficiary of the agreement;
3. USFWS has approval authority over the language in the document, and it must state that modifications or transfer of the endowment to another holder are only allowed with USFWS approval;
4. This agreement can also be called: “Trust Agreement”, “Declaration of Trust”
5. When the National Fish and Wildlife Foundation (NFWF) holds the endowment, they call this a “Recipient Agreement”, and may have an additional MOA with the Project Applicant.

Appendix B

CDFW's Habitat Management Land Acquisition (HMLA) Process Overview for Applicants

Habitat Management Land Acquisition (HMLA) Process Overview for Project Applicants

This document describes for Project Applicants the process the Department of Fish and Game (DFG) follows for reviewing habitat management land acquisitions (HMLA). It reflects information needed from the Project Applicant as listed in the Habitat Management Land Acquisition Checklist for Project Applicants. The review process is generally the same whether the DFG will be grantee for an easement, will accept fee title or another party holds the easement and DFG is a third party. Please direct all questions about the HMLA process to your Region Contact.

1. HMLA Site Evaluation

   a. Permit or mitigation agreement development is initiated.

   b. Project Applicant (PA) contacts Region Contact (RC) about potential mitigation sites.

   c. RC provides HMLA process information, templates and forms to PA:
      - Proposed Land for Acquisition Form (PLFAF)
      - HMLA Process Overview for Project Applicants (this document)
      - HMLA Package Checklist for Project Applicants.

   d. Areas potentially suitable for acquisition can be discussed by the PA and RC. The PA proposes the habitat management lands/mitigation sites by submitting documents to RC:
      - Completed Proposed Land for Acquisition Form (PFLAF) (one form for each site)
      - Site location map showing the proposed habitat management land/mitigation site(s).

   e. RC reviews documents, coordinates with other agencies involved in approving the mitigation, and conducts site visit(s) with PA (and landowner(s) if the PA does not own the property).

RC may ask for a biological resources survey and preliminary title report for the property.

2. Conceptual Approval

- Permit or mitigation agreement is finalized/approved.
- RC and PA reach agreement on selection of land and land conservation mechanism. If the land will be conserved by a conservation easement, RC and PA should discuss who will hold the easement[1].
- RC gives conceptual approval by signing the PLFAF and sending it to the PA along with additional HMLA process information/forms/templates:
  - DFG Conservation Easement Deed template
  - A Guide and Annotated Outline for Writing Land Management Plans, March 2002
  - Summary of Transactions example
- PA:
  - opens escrow account
  - proceeds with preparing or obtaining the documents required in the HMLA Package Checklist for Project Applicants for submission to DFG:
    - Phase I Environmental Site Assessment,
    - Preliminary Title Report (less than 6 months old) and Policy of Title Insurance,
    - Copies of documents supporting any title exceptions or title encumbrances,
    - Plat map of the property showing existing easements, structures, etc.,
    - County Assessor Parcel Map(s),
    - Copy of the current tax bill for the property,
    - Copy of final permit or agreement,

[1] Per Civil Code Section 815.3, the conservation easement can only be held by 1) a tax-exempt non-profit organization qualified to do business in the State of California and whose primary purpose is conservation activities; or 2) a State or local agency or entity.

- If the PA is a business, a copy of the document specifying the names of the individuals that are the legally authorized to sign the documents.   For a corporation, trust, or partnership, provide a resolution document on business letterhead,
- Final Management Plan (if the Grant Deed or Conservation Easement deed will incorporate a Management Plan by reference or if the permit or mitigation agreement requires a Management Plan),
- Biological resources report,
- Draft Summary of Transactions.

- The PA may work with the RC on preliminary review of items in the HMLA package to discuss/ resolve any issues or red flags prior to submission of the complete HMLA package.
- PA works with RC to prepare the Conservation Easement or Grant Deed.

3. Project Applicant Submittal of the HMLA Package

Once the Conservation Easement or Grant Deed is drafted and the rest of the HMLA package is complete, PA submits two complete sets of the HMLA package to the RC. PA should also submit a copy of the HMLA package to other agencies involved in approving the mitigation site.

4. Review of the HMLA Package

The HMLA package submitted to the RC must be complete. The package will be returned to the PA if it is not complete.

RC coordinates with the other agencies to review the package for completeness and content and works with the other agencies and the PA to gather more information or revise the Conservation Easement deed if necessary.

RC works with the PA to resolve issues or red flags that arise during review of the HMLA package.

5. Revised Drafts of Documents in the HMLA Package

Revised documents will be reviewed by DFG and the other agencies. There may be several rounds of revisions before all parties are satisfied with the form and content of the documents.

6. Final Region Review of the HMLA Package

Once all the reviewing agencies are satisfied with the contents of the HMLA package, the Region does a final check to ensure the HMLA package is complete.

7. Final HMLA Package Submission

The HMLA package and the final draft Conservation Easement Deed are submitted to the Land and Facilities Branch (LFB)[2] - Realty Services Coordinator (RSC).

*Final processing may take two to four months.

8. Conservation Easement Approved as to Form

a. The final draft Conservation Easement deed is sent to the DFG Office of the General Counsel (OGC) for review. The Easement or Grant Deed must be approved as to form by OGC and U.S. Fish and Wildlife Service (FWS) if necessary). “Approved-as-to-form” means that the document content and form formally meets approval of all the reviewers. OGC must be satisfied that the form and content of the document is legally sound before they will approve (sign) the Conservation Easement deed. The FWS (if involved in the mitigation) may require their approval-as-to-form and include their

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[2] LFB's role in the Department of Fish and Game is to work with Department Branches and Regions to:

- ► develop and implement statewide policies relative to the acquisition, protection, maintenance, and enhancement of Fish and Game lands and facilities
- ► develop and implement guidelines for the preparation of land management plans that focus on fish and wildlife needs
- ► seek cooperative relationships with landowners of properties adjacent to Fish and Game lands maintain an inventory of Fish and Game lands.

signature page for this purpose. OGC coordinates with the FWS to get their approval-as-to-form on the Conservation Easement (before it is approved as to form by OGC).

b. Once the Conservation Easement (or Grant Deed) form and content is acceptable to OGC, OGC sends the Conservation Easement to the PA for signature.

c. The PA signs and notarizes the Conservation Easement (or Grant Deed) and sends it back to OGC.

1) If DFG will hold the easement, OGC signs the Conservation Easement deed and forwards it to LFB.

2) If DFG will not hold the easement (i.e., it will be held by another government agency or a non-profit conservation organization), OGC sends the Conservation Easement to the Region. Region sends the Conservation Easement to the PA with instructions to record the easement and send copies of the recorded easement to the Region and the other agencies. The PA's mitigation obligations will not be considered final until a copy of the recorded easement is returned to the Region.

10. LFB Review of HMLA Package and Final Acceptance

RSC conducts review of the HMLA package. The RSC may need to work with the PA on concerns/issues with the status of the title. Once the HMLA package meets the RSC's approval, the HMLA package is processed to get final approvals for acceptance of the proposed habitat management land/mitigation site.

When final processing for acceptance is complete, the Wildlife Conservation Board (WCB)[3] signs the Certificate of Acceptance. The County Recorder cannot record the Conservation Easement or Grant Deed without a Certificate of Acceptance attached. The Conservation Easement is sent to the title company holding the escrow account. When escrow closes, the Conservation Easement is recorded and the title company sends a copy

[3] WCB is responsible for authorizing the acquisition of land and waters suitable for the preservation, protection, and restoration of wildlife habitat. Acquisition of land simply means acquiring an interest in real property. Agencies acquire property interests such as fee title interest, easements (conservation/habitat, agriculture, roads, etc.), license, or lease. The interest can be acquired by purchase, donation, or transfer. All Department of Fish and Game acquisitions must be approved by WCB. WCB's authority is mandated in Fish and Game Code 1300, et seq.

of the recorded easement to the Wildlife Conservation Board (WCB). LFB and the Region receive a copy of the recorded easement from WCB.

Potential Fees or Expenses Associated with HMLA transactions

This list includes many of the possible fees or expenses the PA may encounter in the HMLA transaction. This list is informative only, and the fees or expenses are not restricted by or limited to those listed.

The GRANTOR shall pay for all land acquisition costs including:

Preliminary Title Report(s) for subject property. Additional documents that may add to expense:

- document(s) to support title exceptions
- document(s) to explain title encumbrances
- a plot or map of easements/encumbrances on the property

Phase I Environmental Site Assessment Report

Final Title Report

Title Insurance Premiums

Final Permit or Agreement requiring land acquisition

- Financial Assurances – initial enhancement, expected property value security, fees for security types (ie. letters of credit)
- Management Endowment funds

Biological resources survey and report

Wetland delineation

Management Plan preparation

Mitigation monitoring plan preparation

DFG real estate review fees

Notary fee

Recording fees

Escrow fees

Reconveyance fees

Trustee's or forwarding fees for any reconveyance of deed of trust or release charge

Property taxes for the fiscal year in which this escrow closes

Property taxes remain the responsibility of Grantor

Subordination fees

Fees to request copies of records (e.g., current tax bill, copies of documents affecting title, etc.)

Special District fees

Permit fees

Water rights application fee

Property boundary survey/placement of survey markers

Re-zoning

Appraisal fee (the value of the land is needed for tax purposes)

Trash removal

Additional Environmental Site Assessments (e.g., Phase II or Phase III)

Hazardous materials removal

Fencing (if necessary for protection of the land)

Appendix C
Mitigation Property Prospectuses

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: URS, 2013; Kings County, 2012.

September 26, 2013

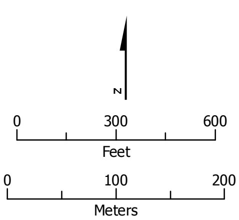


Figure 1
Burr Property

C1.0 Buena Vista Dairy Property

The Buena Vista Dairy was identified as a candidate mitigation property as part of a mitigation site selection analysis. In response to a Permission-to-Enter mailing initiated in November 2011, Buena Vista Dairy representative James Borba responded on behalf of Buena Vista Dairy, granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable mitigation resources onsite.

After the initial reconnaissance-level survey was performed, in March 2012 the landowner was contacted to confirm their interest in pursuing compensatory mitigation with the Authority at this location, and in May 2012 title reports were requested for the APNs under investigation. The Authority and its consultants have continued to work with Buena Vista Dairy through the coordination of wetland delineation, California Rapid Assessment Method (CRAM) assessment, and focused protocol-level surveys in 2012.

The Buena Vista Dairy property consists of two adjacent assessor parcel numbers (APNs) in Kern County. The two parcels total 715 acres (161 and 554 acres, respectively), are predominantly undisturbed and show evidence of intact, natural communities, including alkali desert scrub, annual grassland, vernal pools, and depressional wetlands formed from remnant riverine features. The parcels are bounded by Interstate 5 (I-5) to the west, Taft Highway 119/Old River Road (also known as [aka] Pumpkin Center Road) to the north, and active agricultural land to the south and east (Figure 1). The parcels are just south of the Kern Water Bank. Together with portions of the Kern Water Bank, the Buena Vista Dairy property and the surrounding natural lands provide approximately 5,000 acres of contiguous open space east of I-5 suitable for special-status wildlife species. The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. In the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Buena Vista Dairy property is in the Kern Lake–Buena Vista Lake planning area, where various wildlife and wetland conservation projects have been proposed or are under consideration.

C1.1 Wetland Resources

C1.1.1 Reconnaissance Surveys and Condition Assessment

The Buena Vista Dairy property is within the Middle Kern–Upper Tehachapi Grapevine HUC-8 watershed. Site visits conducted in 2012 confirmed the presence of an extensive network of vernal pools in the northeastern half of the properties (photo, right; Figure 2). In two locations, 3- to 6-foot-tall man-made berms/levees cross the properties. In addition, two historical riverine features with distinct ordinary high water marks (OHWM) exist on the properties. Water historically flowed in a southwesterly direction but has been diverted by the large berms/levees. On the northeastern side of the berms/levees, the riverine features function as depressional wetlands but have maintained most of their natural geometry and support scattered riparian vegetation.

In 2012, the California Rapid Assessment Method (CRAM) was conducted on the Buena Vista Dairy property. Five Assessment Areas (AAs) were evaluated on the parcels: two depressional wetlands, one individual vernal pool, and two vernal pool systems. The depressional wetland AAs received nearly identical overall CRAM scores (70.5 and 70.9). Of the four attributes evaluated under CRAM, both AAs scored relatively low on the Physical Structure and Biotic Structure attributes because the AAs lacked physical and biotic diversity and because they contained a nonnative invasive plant species. The individual vernal pool received an overall CRAM score of 75.4, scoring relatively high on Buffer and Landscape and Hydrology attributes. It scored lower on the Physical and Biotic Structure attributes because of moderate structural patch richness and a lack of endemic vernal pool plant species, respectively. The two vernal pool system AAs received the highest overall CRAM scores (80.6 and 81.7), scoring high for all attributes except Biotic Structure. Like the individual vernal pool AA, no endemic vernal pool plant species were identified in the AAs.

On February 12, 2013, regional consultant (RC) biologists visited the site with Zach Simmons (USACE) and Clifford Meek (EPA). Based on this visit, wetland mapping was revised resulting in a decrease in vernal pool acreage and an increase in depressional wetland acreage compared to the original assessment. In addition, during the site visit the USACE indicated that the threat of land conversion in the area is sufficient to justify USACE accepting the preservation of the existing features as part of the mitigation palette.

C1.1.2 Environmental Stressors

The stressors identified by CRAM include the transportation corridor of Interstate 5 and Route 119 and the man-made berms/levees that have altered the remnant riverine hydrology and allowed access to more remote sections of the parcels, leading to illegal dumping onsite. Row crop agriculture on property adjacent to the Buena Vista Dairy parcels also potentially negatively affects natural resources on the site.

C1.2 Wildlife Assessment

C1.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on December 27, 2011, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Buena Vista Dairy property were alkali desert scrub and annual grasslands, which support vernal pool complexes, vernal swales, and depressional wetland features. These parcels are adjacent to existing protected natural lands (Kern Water Bank) and lie within the California Essential Habitat Connectivity Corridor; the San Joaquin Kit Fox Western Kern County Core Area; the Kern River Missing Linkage; and the South Coast Wildlands Tehachapi Connection linkage (which provides circular connectivity between the Sierra Nevada and South Coast Range mountains and the Great Central Valley via the Kern River riparian corridor. The Kern River is 3 miles north. The natural vegetation communities present onsite provide relatively undisturbed, high-quality habitat suitable for blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity, and have been reported or have the potential to be present on the properties.

C1.2.2 Desktop Review

RC GIS specialists conducted a CNDDB query at a 5-mile buffer for the species requiring mitigation (Figure 1). The closest reported blunt-nosed leopard lizard observations are on natural

lands approximately 0.35 mile to the east and 2.78 miles to the west of I-5 (in 1974). The alkali desert scrub and annual grasslands on the properties provide suitable habitat for the species.

The closest reported Swainson's hawk observation is approximately 5 miles north along the Kern River (in 1994). Several mature trees present on the properties could provide suitable nesting habitat for nesting pairs, and the surrounding alkali desert scrub, annual grasslands, and agricultural lands provide suitable foraging habitat for the species. The parcels are just south of the Taft Highway 119/Old River Road (aka Pumpkin Center Road), which the California Department of Fish and Wildlife (CDFW) recognizes as the southernmost limit of the range where nesting of the species has been recorded in the Central Valley.

Multiple western burrowing owl observations were reported on the properties in 2006, and burrowing owls were observed during the 2011 and 2012 reconnaissance surveys.

The last reported observation of the Nelson's antelope squirrel was at the Kern Water Bank, approximately 0.7 miles to the east (in 1999). The alkali desert scrub and annual grasslands on the properties provide suitable habitat for the species.

A Tipton kangaroo rat observation was reported on the properties in 1985. The alkali desert scrub and annual grasslands onsite provide suitable habitat for the species.

San Joaquin kit foxes were last reported on the properties in 2001; additional observations were reported in the region in 1975, 1977, 1981, and 1999. The alkali desert scrub and annual grasslands on the properties provide suitable denning and foraging habitat for the species.

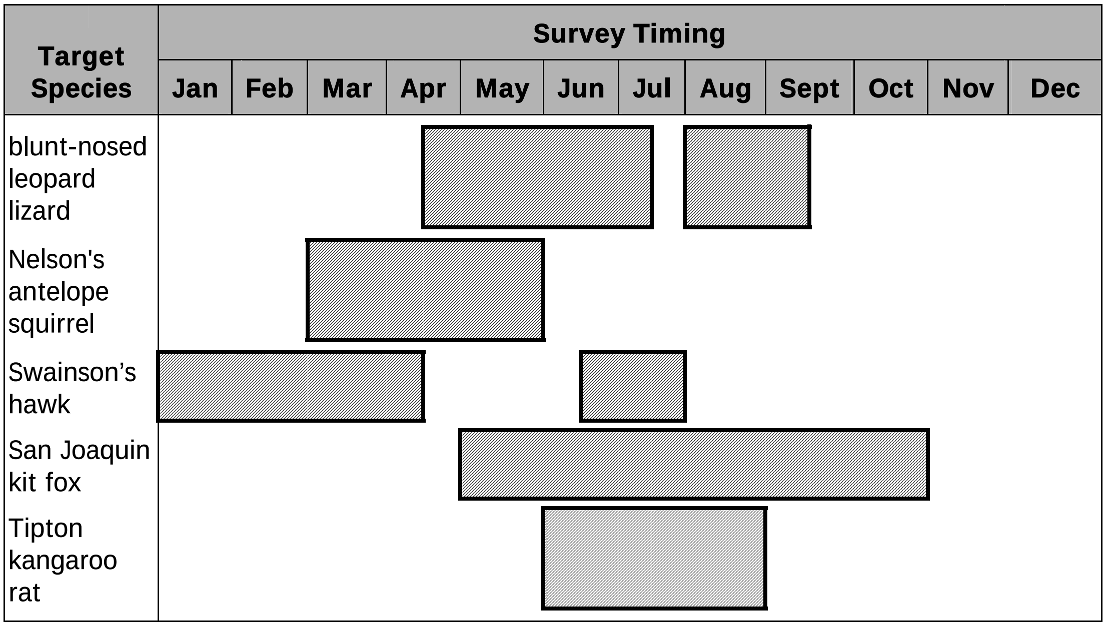
C1.2.3 Focused Wildlife Surveys

RC biologists met with CDFW representatives on June 6, 2012, to discuss the potential mitigation sites and agencies' determination of current species presence. For the Buena Vista property, the CDFW requested surveys for blunt-nosed leopard lizard, Swainson's hawks, and Nelson's antelope. CDFW concurs that Tipton kangaroo rats are likely present onsite, but requested that surveys be performed to confirm their presence because this species was last observed onsite in 1985. CDFW biologists also suspect there may be evidence of San Joaquin kit fox at Buena Vista, but requested surveys to confirm their presence.

RC biologists have conducted focused surveys to determine the presence of special-status wildlife species at the Buena Vista Dairy. One round of focused surveys was conducted on August 6 and 21, 2012, to coincide with the survey windows (see table below) for blunt-nosed leopard lizard, Tipton kangaroo rat, and San Joaquin kit fox. RC biologists returned to Buena Vista Dairy for additional focused surveys between April 15 and 19, 2013. Both surveys included use of camera trapping stations, pedestrian surveys, and nighttime spotlighting to identify other special-status wildlife species. Small-mammal trapping was conducted only during the August 2012 surveys.

During the surveys, RC biologists used the following criteria from the previous reconnaissance survey to identify appropriate target survey areas on these properties:

- Presence of small-mammal burrow complexes.
- Presence of kangaroo rat sign (e.g., burrows in sandy soil, dust bath areas, tail drags).
- Proximity to known populations of special-status species.
- Habitat integrity.



Methods

Small-Mammal Trapping

Live-trapping in August 2012 was conducted according to Tipton kangaroo rat survey protocols, as described in CDFW's "Region 4 approved survey methodologies for sensitive species" (CDFG 1990) as well as protocols outlined in the USFWS Section 10(a)(1)(A) Recovery Permit for federally listed small-mammal species of the Central Valley. All surveys were conducted under the supervision of Endangered Species Recovery Program (ESRP) biologists Brian Cypher and Christine Van Horn Job under a USFWS Section 10(a)(1)(A) Recovery Permit for the federally listed Tipton kangaroo rat.

Modified Sherman aluminum box traps were deployed at approximately 15-meter intervals along four transects; a total of 30 traps were placed along each transect (Figure 3). Traps were provisioned with millet seed (bait) and a paper towel (bedding). Traps were opened at dusk on August 6, 2012, and checked before sunrise the next morning, August 7, 2012, for a total of 120 trap nights. The ESRP memorandum included as Appendix D provides a detailed description of small-mammal trapping methods (Appendix D).

No small-mammal trapping was conducted in April 2013.

Camera Trapping

August 2012: Heat and motion-triggered digital camera traps were installed at two locations onsite, corresponding with active burrows, game trails, or other sign to detect blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrel, Tipton kangaroo rats, and San Joaquin kit fox (Figure 3). Both stations were baited with cat food and oats. Camera station 1 was set on August 7, 2012, and camera station 7 was set on August 11, 2012. Both stations were removed on August 21, 2012. All photos were inspected visually and digitally catalogued in a database.

April 2013: RC biologists set three additional cameras at the Buena Vista property using the same methodology described above (see Figure 3 for camera station locations). Camera stations 3 and

4 were set from April 16–May 1, 2013. Camera station 5 was set up on April 18, 2013, and taken down on May 1, 2013. This station was set using a film-camera Trailmaster. This model is an older but dependable model that uses an infrared sensor beam that, when interrupted, triggers the camera.

Pedestrian Survey

August 2012: RC biologists conducted pedestrian surveys for evidence or direct observation of blunt-nosed leopard lizards, Swainson's hawks, Tipton kangaroo rats, and San Joaquin kit foxes. Although surveys were not performed in strict accordance with agency-approved protocols, three of the biologists (Jolie Hendricks, Melissa Newman, and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Biologists walked random transects and noted all vertebrate species observed. All sign (burrows, tracks, bones, scat) that may indicate presence of listed species was photographed and/or recorded with a Global Positioning System (GPS) point. Scat of appropriate shape and size for kit fox was collected and recorded (location, date), and placed in a brown paper bag to keep the sample from molding or decaying. All scat samples were sent to Dr. Ben Sacks, Canid Diversity and Conservation Unit Center for Veterinary Genetics at UC Davis for genetic analysis.

Biologists conducted nighttime spotlighting along the eastern and western sides of the property on August 11, 2012. Spotlight surveys began approximately 1 hour after sunset. Biologists slowly drove the roads while using high-powered spotlights to scan habitat. The light illuminates the movement and shape of animals and their eyeshine, making them very visible. To the extent possible, all eye shine detected during spotlighting surveys was identified to species. The spotlight route was clearly marked on a map and species data were recorded.

During the cumulative site visits, all of the parcel perimeters were driven and approximately 30% of the property was covered on foot.

April 2013: RC biologists conducted pedestrian surveys using the methodology described above. The daytime transect surveys were conducted on April 16, 2013. Biologists also conducted surveys 2 days later, during the late afternoon on April 18, and returned to the site after dark to drive the perimeter of the property and spotlight. Two of the biologists (Tammy Lim and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Results

Small Mammal Trapping: Captures included one Tipton kangaroo rat (Figure 3), four Heermann's kangaroo rats (*Dipodomys heermanni*), and one deer mouse (*Peromyscus maniculatus*). Only one night of trapping was necessary to confirm presence.

Camera Trapping

August 2012: The camera trapping effort totaled 24 trap nights and 3,124 images. Most of these were blank, but at least five species were positively identified. Camera trap photos depicted desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), coyotes (*Canis latrans*), kangaroo rats (*Dipodomys* spp.), and a burrowing owl. No kit fox or other target species were detected through photographs. Kangaroo rats were observed in the photographs but species identification requires physical inspection of the hind leg and is not possible with camera trap photos.

April 2013: Digital camera stations 3 and 4 were set for 30 trap nights; 2,080 images were taken. The Trailmaster camera took nine images, but the wire leading from the infrared beam to the

camera was cut sometime after setup; most likely it was chewed through by a rodent. The number of functional trap nights for the Trailmaster is unknown.

Many of the photos were blank, but the camera traps did "capture" photos of a lizard, most likely a side-blotched lizard (*Uta stansburiana*), a great egret (*Ardea alba*), a bobcat (*Lynx rufus*), a domestic dog (*Canis domesticus*), California ground squirrels (*Otospermophilus beecheyi*), desert cottontails, black-tailed jackrabbits, kangaroo rats, and a pair of ducks—most likely lesser scaup (*Aythya affinis*).

Pedestrian Surveys

August 2012: During meandering transect surveys, biologists noted multiple animal species, a domestic animal carcass, and a red-tailed hawk (*Buteo jamaicensis*) nest onsite. No Nelson's antelope squirrel, Swainson's hawk or other target species were detected during pedestrian surveys. During nighttime spotlighting, biologists observed burrowing owls, numerous desert cottontails (*Sylvilagus audubonii*), and kangaroo rats (*Dipodomys* spp.) on the property. Despite nearby farming activity, insects were numerous. A wetland area and small ponded area at the southeastern corner of the property harbored a non-native bullfrog (*Lithobates catesbeianus*) population. No usable DNA was recovered from the potential San Joaquin kit fox scat to permit genetic analysis.

April 2013: A number of additional bird species were observed during surveys; most notably, tri-colored blackbirds (*Agelaius tricolor*) flocked on a mesquite tree near the eastern side of the property. They were likely foraging on the flooded fields to the east. When RC biologists returned on May 1, 2013, to retrieve the camera traps, they observed yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) in the same flooded fields.

A list of species observed during all field efforts is provided below.

Class	Common Name	Scientific Name
amphibians	boreal toad	*Anaxyrus boreas boreas*
	American bullfrog	*Lithobates catesbeianus*
reptiles	common side-blotched lizard	*Uta stansburiana*
	tiger whiptail	*Aspidocelis tigris*
	western rattlesnake	*Crotalus oreganus*
birds	mallard	*Anas platyrhynchos*
	lesser scaup	*Aythya affinis*
	pied-billed grebe	*Podilymbus podiceps*
	great egret	*Ardea alba*
	white-faced ibis	*Plegadis chihi*
	northern harrier	*Circus cyaneus*
	red-tailed hawk	*Buteo jamaicensis*
	American coot	*Fulica americana*
	killdeer	*Charadrius vociferus*
	black-necked stilt	*Himantopus mexicanus*
	mourning dove	*Zenaida macroura*
	greater roadrunner	*Geococcyx californianus*
	burrowing owl	*Athene cunicularia*

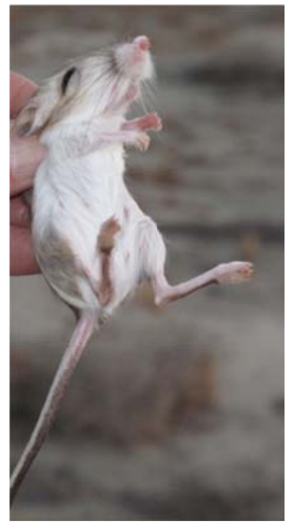
Class	Common Name	Scientific Name
	American kestrel	*Falco sparverius*
	western kingbird	*Tyrannus verticalis*
	common raven	*Corvus corax*
	cliff swallow	*Petrochelidon pyrrhonota*
	northern mockingbird	*Mimus polyglottos*
	song sparrow	*Melospiza melodia*
	white-crowned sparrow	*Zonotrichia leucophrys*
	blue grosbeak	*Passerina caerulea*
	red-winged blackbird	*Agelaius phoeniceus*
	tricolored blackbird	*Agelaius tricolor*
	western meadowlark	*Sturnella neglecta*
	great-tailed grackle	*Quiscalus mexicanus*
	house finch	*Haemorhous mexicanus*
mammals	California ground squirrel	*Otospermophilus beecheyi*
	deer mouse	*Peromyscus maniculatus*
	Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*
	Heermann's kangaroo rat	*Dipodomys heermanni*
	San Joaquin pocket mouse	*Perognathus inornatus inornatus*
	desert cottontail	*Sylvilagus audubonii*
	black-tailed jackrabbit	*Lepus californicus*
	bobcat	*Lynx rufus*
	coyote	*Canis latrans*
	domestic dog	*Canis lupus familiaris*

Summary

A summary of species presence, either confirmed or presumed, on the Buena Vista Dairy is provided here.

- Blunt-nosed leopard lizard: No lizards were seen at the Buena Vista Dairy. However, habitat conditions are good for this species (Brian Cypher, personal communication, September 20, 2012) and further focused surveys may confirm presence.
- Burrowing owl: Numerous owls and extensive burrows were observed during surveys and via camera trapping efforts (see photo, right). California ground squirrels are relatively common onsite, providing burrow complexes for the owls.

- Swainson's hawks: No Swainson's hawks were observed. The red-tailed hawk nest indicates that trees on the property are large enough to support a Swainson's hawk nest. Abundant small-mammal activity provides a good prey base for hawks.
- Nelson's antelope squirrel: This species is most active during the spring. Surveys did not detect antelope squirrels but the habitat – open, with sparse vegetation – is highly suitable for the species (Brian Cypher, personal communication, September 20, 2012).
- Tipton kangaroo rat (right): A single Tipton kangaroo rat was captured onsite. The habitat is suitable for the species, though garbage, trespassing and recreational use may threaten the habitat quality.



- San Joaquin kit fox: Usable DNA was not recoverable from the scat collected on the property. Brian Cypher (personal communication, September 20, 2012) notes that Buena Vista Dairy provides highly suitable habitat and is contiguous with suitable habitat in the region and therefore, there is a high potential for kit foxes onsite.

C1.3 Next Steps

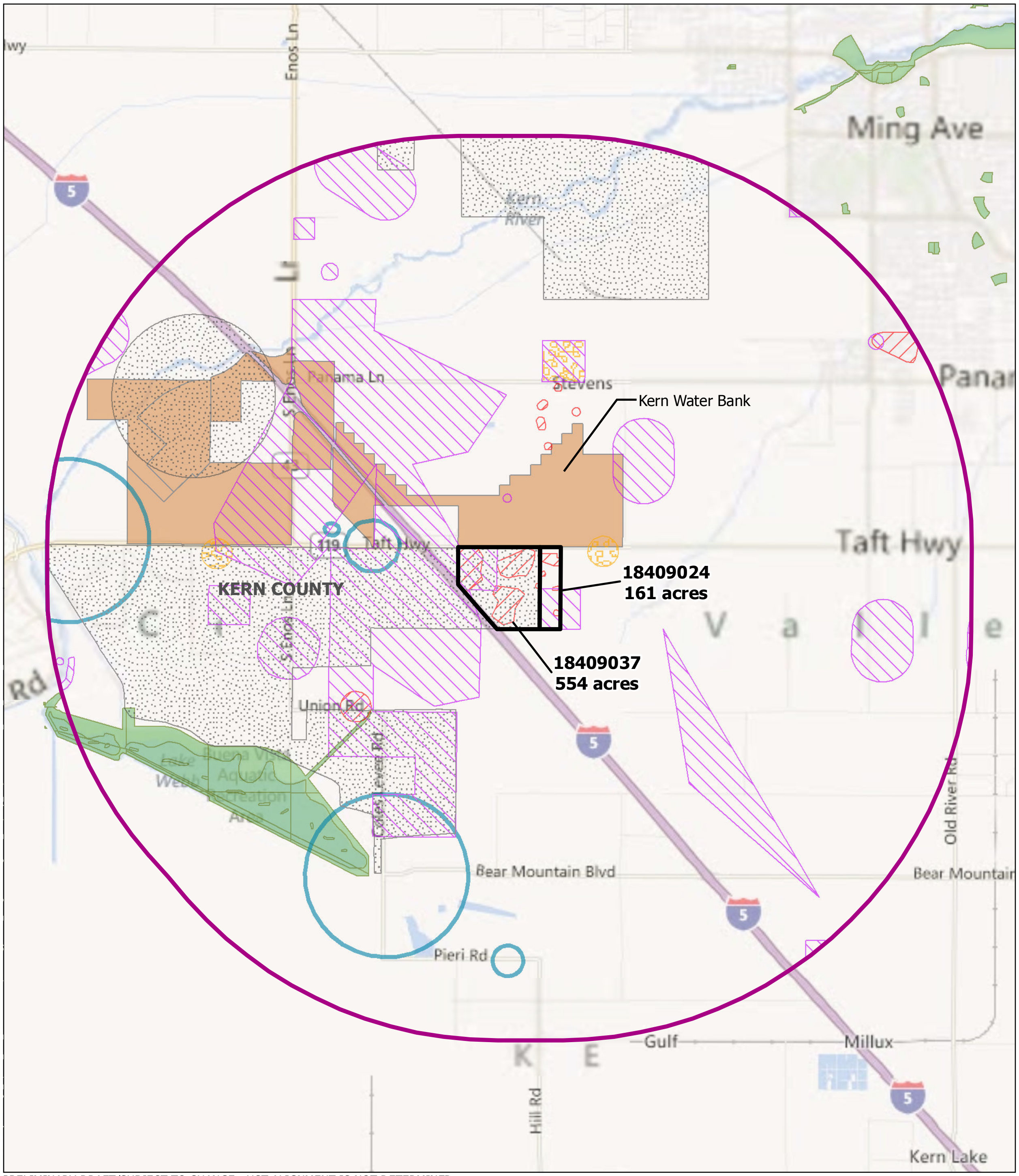
Aquatic and upland habitats on the properties provide suitable opportunities for enhancement (exclusion of vehicles, garbage removal, control of non-native bullfrogs) and preservation.

Follow-up surveys for the blunt-nosed leopard lizard, Swainson's hawk, and Nelson's antelope squirrel during the first two weeks of April 2013 may confirm presence of these species. Although no usable DNA was recovered from the scat to permit genetic analysis, good habitat quality warrants further surveys. However, if these species are not present, then the site would be an excellent candidate for reintroduction of native threatened or endangered wildlife. If warranted, the mature trees on the properties could be augmented with tree plantings to encourage Swainson's hawk to nest and forage onsite.

Future coordination with agency personnel will be critical in the development of a conservation easement on the property and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Buena Vista Dairy Property (715 acres)	
Resource Type	**Acreage Available**
Wetlands	
Vernal pool	83.7 ac
Depressional wetland	33.6 ac
Riverine	N/A
Wildlife	
vernal pool fairy shrimp	N/A
vernal pool tadpole shrimp	N/A
blunt-nosed leopard lizard	715 ac
Swainson's hawk	715 ac
western burrowing owl	715 ac
Nelson's antelope squirrel	715 ac
Tipton kangaroo rat	715 ac
San Joaquin kit fox	715 ac

ac = acres
N/A = not applicable



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
October 8, 2012
Source: Bing Imagery maps, CNDDB 2012

Special-status species
- Blunt-nosed leopard lizard
- Burrowing owl
- Nelson's antelope squirrel
- San Joaquin kit fox
- Tipton kangaroo rat

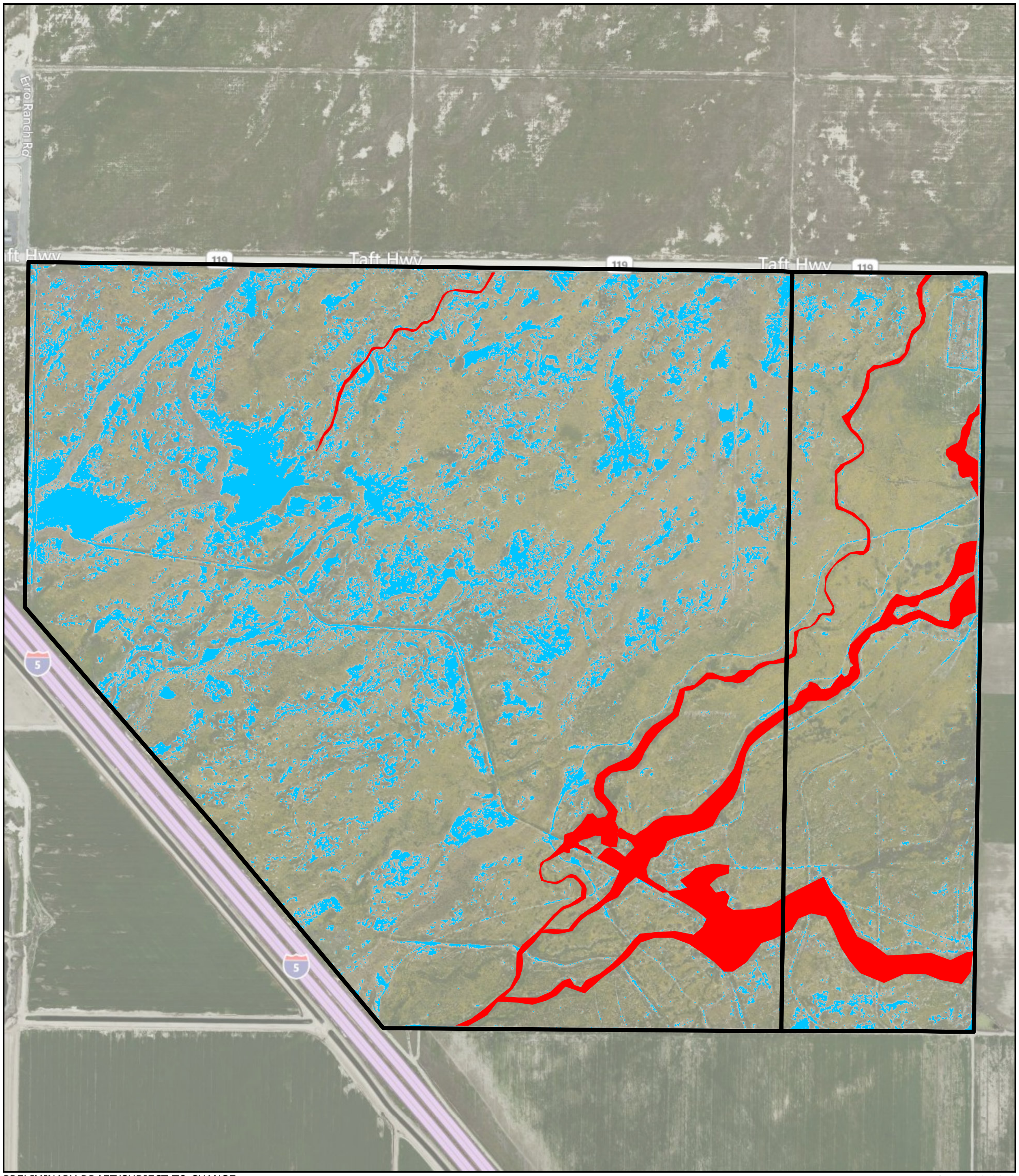
- Parcel boundary
- 5-mile buffer
- Public lands
- Kern Water Bank

N

0 1 2
Miles

0 2 4
Kilometers

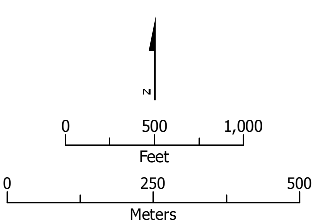
Figure 1
CNDDB occurences and critical habitat
Buena Vista Dairy properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE

Source: Microsoft BING Imagery, March 2011; URS, 2013.

February 26, 2013



Parcel boundary

Vernal pool

Depressional wetland

Figure 2
Wetland survey map
Buena Vista Dairy properties

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Data source: URS, GPS Data 2013

September 24, 2013

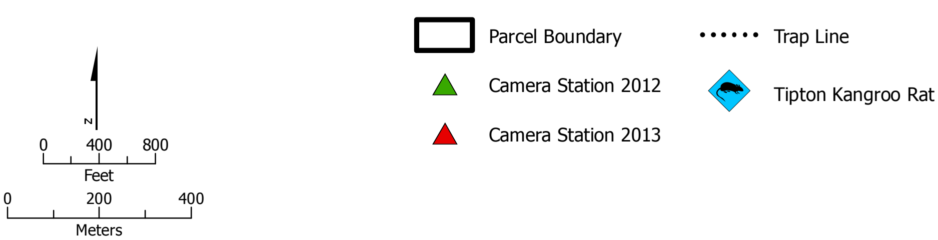


Figure 3
Special-status species survey results
Buena Vista Dairy properties

C2.0 Davis Property

The Davis property was identified as a candidate mitigation property as part of a mitigation site selection analysis. In response to a Permission-to-Enter mailing initiated in November 2011, landowners Walter and Ida Lucille Davis responded, granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable mitigation resources onsite. After the initial reconnaissance-level survey was performed, in March 2012 the landowners were contacted to confirm their interest in pursuing compensatory mitigation with the Authority at this location, and in May 2012 title reports were requested for the APN under investigation. The Authority and its consultants have continued to work with the Davis family through the coordination of wetland delineation, CRAM assessment, and focused protocol-level surveys in 2012.

The Davis property consists of a single assessor parcel number (APN) in Kern County. The parcel is large (158 acres), predominantly undisturbed, and shows evidence of intact, natural communities, including alkali desert scrub, annual grassland, a large vernal swale, and seasonal wetlands. The parcel is bounded by the Semitropic Ecological Reserve to the north, south, and east and is separated from the Kern National Wildlife Refuge by Corcoran Road to the west. The Semitropic Ecological Reserve and Kern National Wildlife Refuge are characterized by alkali desert scrub and annual grasslands (Semitropic Ecological Reserve) and seasonal wetlands (Kern National Wildlife Refuge). The parcel abuts the Semitropic Ecological Reserve without any fence lines or impediments to terrestrial or hydrologic connectivity; however, Corcoran Road may act as an impediment to hydrologic connectivity between the parcel and the Kern National Wildlife Refuge (Figure 1). Together with the Semitropic Ecological Reserve, the Kern National Wildlife Refuge, and the Valadez property (a 120-acre parcel also under consideration as a proposed mitigation property), the Davis property and the surrounding natural lands provide more than 50,000 acres of contiguous open space east of Interstate 5 suitable for special-status plant and wildlife species. The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. In the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Davis property is in the Goose Lake planning area, where various wildlife and wetland conservation projects have been proposed or are under consideration.

C2.1 Wetland Resources

C2.1.1 Reconnaissance Surveys and Condition Assessment

The Davis property is within the Tulare–Buena Vista Lakes HUC-8 watershed. Site visits conducted in 2012 identified surface drainage, a large vernal swale extending from the northeastern region of the property to the southwestern corner, and seasonal depressional wetlands that are concentrated along the western edge of the parcel (Figure 2). Iodine bush (*Allenrolfea occidentalis*), a facultative wetland plant, dominates the site (see photo, right). The depressional seasonal wetlands feature soil cracking, surface biofilms, and salt crust.

In 2012, the California Rapid Assessment Method (CRAM) was conducted on the Davis property. Two depressional wetland Assessment Areas (AAs) were evaluated in the northwestern region of the property. The AAs received similar overall CRAM scores (68.6 and 70.7). Among the four attributes evaluated under CRAM, the AAs scored relatively high on the Buffer and Landscape Context and Hydrology attributes because the AAs have wide buffers, which are in good condition, and natural hydrology. Lack of structural patch richness and topographic complexity resulted in low scores for the Physical Structure attribute. The presence of vertical biotic structure contributed to moderately high scores for the Biotic Structure attribute.

On February 12, 2013, RC biologists visited the site with Zach Simmons (USACE) and Clifford Meek (EPA). During the site visit the USACE indicated that the threat of land conversion in the area is not sufficient to justify USACE accepting the preservation of the existing features as part of the mitigation palette.

C2.1.2 Environmental Stressors

No evidence of previous farming or grazing was apparent during the site visit. The stressors identified by CRAM include the presence of a transportation corridor (Corcoran Road) and flow obstructions due to the presence of a culvert that directs flows beneath Corcoran Road. Additional environmental stressors include evidence of passive recreation (foot trails), off-road vehicle use, invasive non-native vegetation, and fencing.

C2.2 Wildlife Assessment

C2.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on December 29, 2011, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Davis property were alkali desert scrub and annual grasslands, which support vernal pool complexes and vernal swales. This parcel is surrounded by existing protected natural lands (the Kern National Wildlife Refuge and the Semitropic Ecological Reserve) and lies at the epicenter of wildlife movement areas in the Central Valley: the California Essential Habitat Connectivity Corridor; the San Joaquin Kit Fox Northwestern Kern County Satellite Area; and at the junction of the Highway 43–Garces Highway, Poso Creek, Kern Refuge–Semitropic Ridge, Deer Creek–Sand Ridge, and Lost Hill–Semitropic Ridge missing linkages. The natural vegetation communities observed on the property provide relatively undisturbed, high-quality habitat suitable for vernal pool fairy shrimp (*Branchinecta lynchi*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity, and have either been reported or have the potential to be present onsite.

C2.2.2 Desktop Review

Vernal pool fairy shrimp are not reported within a 5-mile buffer of the Davis property.

Blunt-nosed leopard lizards were last reported onsite and in the surrounding grasslands in 1974 and 1985 and in the surrounding natural lands approximately 1.5 and 1.75 miles to the east in the Semitropic Ecological Reserve in 1973, 1974, and 1987. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

The closest reported Swainson's hawk observation is approximately 3.25 miles to the north (in 1994). Several offsite mature trees could provide suitable nesting habitat for nesting pairs, and the surrounding annual grasslands provide suitable foraging habitat for the species. Swainson's

hawk has been confirmed at the Kern National Wildlife Refuge. This species could be encouraged to nest and forage onsite through tree planting.

The closest reported western burrowing owl observation is 1.5 miles north of the property (in 1993); additional observations of this species have been reported in the region in 2004, 2006, and 2007. Burrowing owls have been confirmed to be nesting at the Kern National Wildlife Refuge. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

The closest reported Nelson's antelope squirrel observations were reported approximately 4.2 miles south of the property (in 2007), and the species has been confirmed at the Kern National Wildlife Refuge. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

Tipton kangaroo rats were last reported on the property and on the surrounding properties in 2007. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species, and small-mammal tracks and tail drags were observed onsite, suggesting occupancy by kangaroo rats.

San Joaquin kit foxes were last reported on the property in 2007; additional observations have been reported throughout the surrounding natural lands in the region. San Joaquin kit foxes have been confirmed at the Kern National Wildlife Refuge. The alkali desert scrub and annual grasslands on the property provide suitable denning and foraging habitat for this species.

C2.2.3 Focused Wildlife Surveys

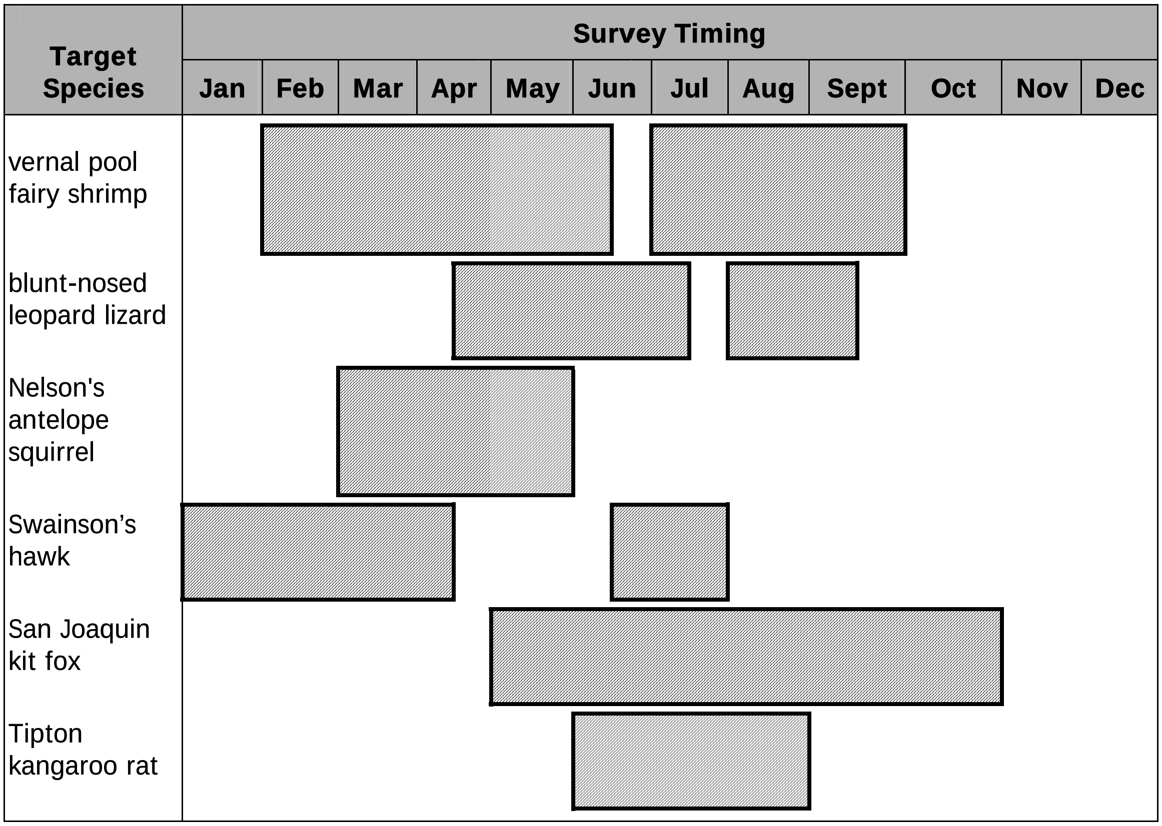
RC biologists met with CDFW and USFWS representatives on June 6, 2012, to discuss the potential mitigation sites and agencies' determination of current species presence. For the Davis property, the CDFW requested surveys for blunt-nosed leopard lizard, Nelson's antelope squirrels, and San Joaquin kit fox. Kit foxes were last seen on the property in 2007, and the agencies require more recent evidence to ascertain presence. The CDFW agreed that Swainson's hawk foraging habitat is present, but no nesting habitat is available. CDFW confirms Tipton kangaroo rats on the Davis property; the USFWS has not yet concurred with this determination but will accept it upon review of the CDFW's data.

In August 2012, RC biologists conducted focused surveys to determine the presence of special-status wildlife species at the Davis property. Biologists set up a camera trapping station and performed pedestrian surveys. The surveys were conducted between August 6 and 21, 2012, to coincide with the survey windows (see table below) for blunt-nosed leopard lizard and San Joaquin kit fox. Dry-season sampling surveys for vernal pool branchiopods were completed in September 2012.

RC biologists returned to the Davis property for additional focused surveys between April 15 and 19, 2013. Both surveys included use of camera trapping stations, pedestrian surveys, and nighttime spotlighting to identify other special-status wildlife species.

During the surveys, RC biologists used the following criteria from the previous reconnaissance survey to identify appropriate target survey areas on these properties:

- Presence of small-mammal burrow complexes.
- Presence of kangaroo rat sign (e.g., burrows in sandy soil, dust bath areas, tail drags).
- Proximity to known populations of special-status species.
- Habitat integrity.



Methods

Dry-Season Sampling

September 2012: On September 19, 2012, an RC biologist with a USFWS Section 10(a)(1)(A) Recovery Permit for federally listed branchiopods conducted dry-season soil sampling. Additional staff worked with the permitted individual in accordance with the recovery permit. Branchiopod cyst sampling consisted of identifying the vernal pools believed to be the most likely to support vernal pool branchiopods and collecting soil samples along transects within the pool. The samples were collected into clean, sealed, plastic bags for transport to a laboratory for future identification. Biologists took relevant data and recorded representative GPS points for each soil sample.

The dry-season soil samples collected previously are currently being processed in the laboratory. The process involves using water and soil sieves to isolate the branchiopod (fairy shrimp) cysts (resting eggs) from the soil matrix. Any cysts that are found will be sent to a genetics laboratory at California State University, Los Angeles. Viable embryos will be extracted from the cysts, DNA will be extracted from the embryos, and genetic analysis will be conducted to determine a more definitive species identification than can be determined morphologically.

Camera Trapping

August 2012: Heat- and motion-triggered digital camera traps were installed at one location onsite corresponding with active burrows, game trails, or other signs to detect blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrel, Tipton kangaroo rats, and San Joaquin kit fox (Figure 3). The station was baited with cat food and oats. Camera station 5 was

set on August 8, 2012, and removed on August 21, 2012. All photos were inspected visually and digitally catalogued in a database.

Spring 2013: RC biologists installed two camera traps on the Davis property. Both cameras were set from April 17, 2013, to May 1, 2013, in areas that had burrows or other areas with evidence of wildlife activity. Both stations were baited with cat food and a peanut butter / oat mix. All photos were inspected visually by multiple reviewers and catalogued in a database. RC biologists checked both camera stations on April 19.

Pedestrian Surveys

August 2012: RC biologists conducted pedestrian surveys for evidence or direct observation of blunt-nosed leopard lizards, Swainson's hawks, Tipton kangaroo rats, and San Joaquin kit foxes. Although surveys were not performed in strict accordance with agency-approved protocols, three of the biologists (Jolie Hendricks, Melissa Newman, and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Biologists walked random transects and noted all vertebrate species observed. All signs (burrows, tracks, bones, scat) that may indicate the presence of listed species were photographed and/or recorded with a GPS point.

Spring 2013: Biologists revisited this site on April 17, 2013, to set up cameras and walk meandering transects. Additional transects were walked on the morning of April 19. A brief site visit with agency representatives was made on May 21, 2013.

Results

Dry-Season Sampling

Seven bags of soil were collected from the Davis property. These samples were carefully labeled and stored in airtight containers and are currently being analyzed to detect and identify the cysts to the level of species group.

Camera Trapping

August 2012: The camera trapping effort totaled 13 trap nights and 309 images. Most of these were blank but a coyote (*Canis latrans*) was photographed. No kit fox or other target species were detected through photographs.

Spring 2013: The RC biologists collected a total of 28 trap nights on camera stations 4 and 5. Camera station 4 collected a total of 511 photos; many of these were of cattle investigating the camera. Additional photos captured common ravens (*Corvus corax*), coyotes, and jackrabbits. Camera station 5 captured 1,541 images. These photos showed many of the species listed above as well as kangaroo rats. The RC biologists were unable to determine the species of kangaroo rat from the photographs alone. No confirmed special-status species were identified from the photos.

Common ravens photographed at camera station 4, 2013.

Common ravens and coyotes at camera station 5, 2013.

Pedestrian Surveys

August 2012: During meandering transect surveys, biologists noted multiple animal species. Biologists found remains of birds and rodents. They also observed raccoon tracks, and an unidentified lizard. A summary of species recorded is provided below.

Spring 2013: Driving to the Davis site in April, RC biologists observed a Swainson's hawk flying approximately 1 mile to the east. No special-status species were observed onsite. The RC biologists did collect a kangaroo rat carcass. It appeared small enough to be a Tipton kangaroo rat. On closer inspection, a fifth toe was found on one of the legs and the carcass was determined to be a Heerman's kangaroo rat.

All species recorded at the site are listed below.

	Common Name	Scientific Name
reptiles	common side-blotched lizard	*Uta stansburiana*
birds	double-crested cormorant	*Phalacrocorax auritus*
	mourning dove	*Zenaida macroura*
	barn owl	*Tyto alba*
	burrowing owl	*Athene cunicularia*
	western kingbird	*Tyrannus verticalis*
	common raven	*Corvus corax*
	violet-green swallow	*Tachycineta thalassina*
	northern rough-winged swallow	*Stelgidopteryx serripennis*
	northern mockingbird	*Mimus polyglottos*
	song sparrow	*Melospiza melodia*
	white-crowned sparrow	*Zonotrichia leucophrys*
	western meadowlark	*Sturnella neglecta*
mammals	Botta's pocket gopher	*Thomomys bottae*
	Heerman's kangaroo rat	*Dipodomys heermanni*
	California jackrabbit	*Lepus californicus*
	bobcat?	*Lynx rufus*
	coyote	*Canis latrans*
	raccoon	*Procyon lotor*

Summary

A summary of species presence, either confirmed or presumed, on the Davis property follows.

- Vernal pool fairy shrimp are not known on the Davis property. High-salinity soils and evidence of suitable vernal pool habitat were present. Further analysis of dry-season samples is ongoing.
- Blunt-nosed leopard lizard: No lizards were seen at the Davis property. However, habitat conditions are optimal for this species (Brian Cypher, personal communication, September 20, 2012) and further focused surveys may confirm presence.
- Burrowing owl: Biologists observed owls onsite during 2013 focused wildlife surveys.
- Swainson's hawks: Swainson's hawks were observed in the general area and are known to be present at the Kern National Wildlife Refuge. The Davis property may not have suitable nesting trees but does provide foraging habitat for hawks.
- Nelson's antelope squirrel: This species is most active during the spring. Surveys did not detect antelope squirrels but the habitat – open, with sparse vegetation – is highly suitable for the species (Brian Cypher, personal communication, September 20, 2012).
- Tipton kangaroo rat: CDFW presumes this species is present onsite. Field surveys confirmed that the Davis property provides high-quality habitat for the species and there are numerous burrow complexes. Additional small-mammal trapping surveys may be warranted.
- San Joaquin kit fox: Focused surveys did not detect San Joaquin kit fox on the site. ESRP is currently conducting kit fox surveys approximately a mile to the south. Those sites are connected to the Davis property with no known barriers to dispersal. Brian Cypher (ESRP) and staff consider the species abundant in the vicinity of the Davis property. Brian Cypher (personal communication, September 20, 2012) notes that Davis provides highly suitable habitat and is contiguous with suitable habitat in the region and therefore, there is a high potential for kit foxes onsite.

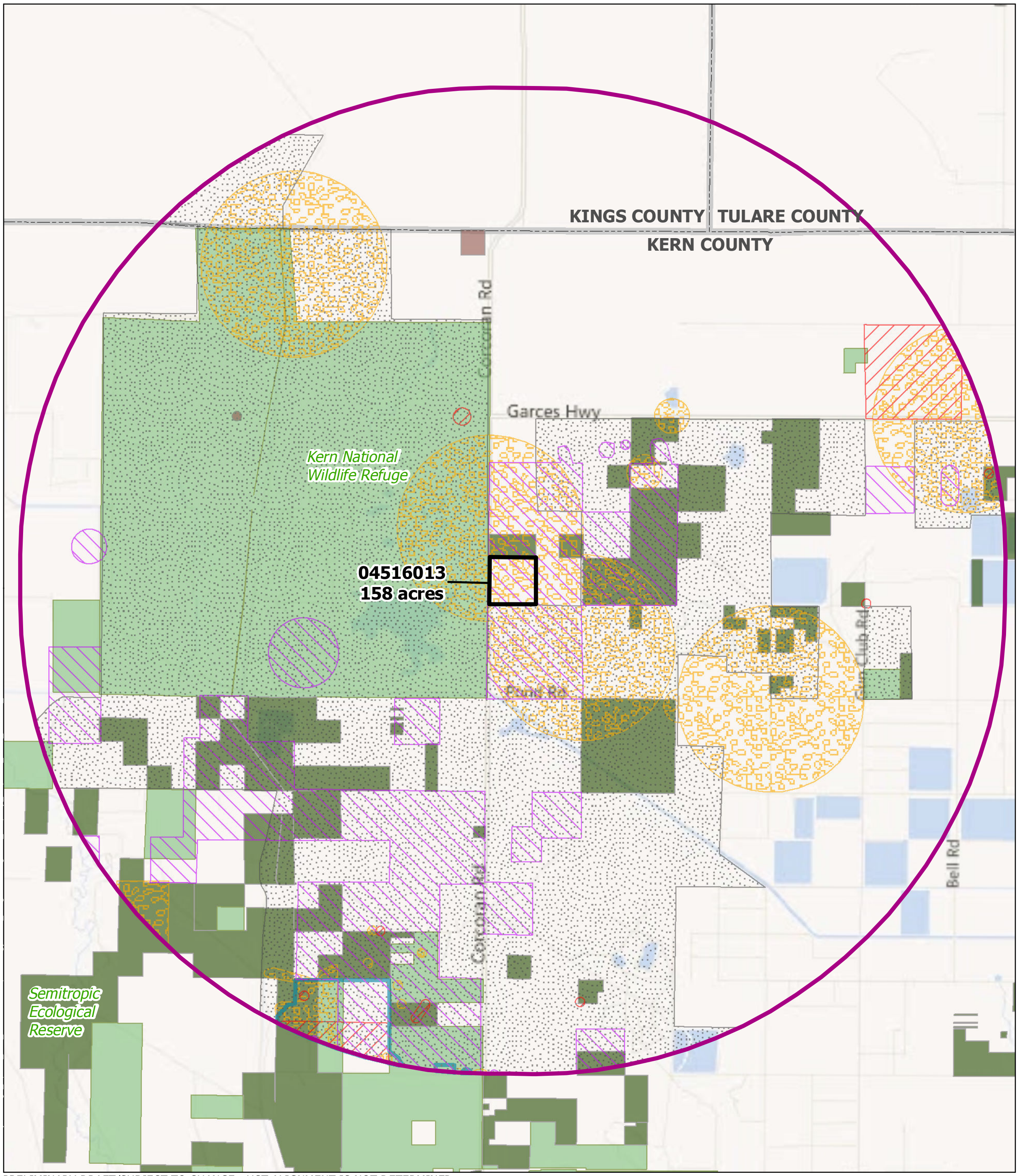
C2.3 Next Steps

Aquatic and upland habitats on the property provide suitable opportunities for enhancement (exclusion of vehicles, grazing management, vegetation management) and preservation. Hydrological modifications on the property may establish or enhance connectivity with the adjacent Kern National Wildlife Refuge.

Further wet-season surveys and analysis of dry-season soil samples and identification of cysts will be performed to confirm the presence of vernal pool fairy shrimp. Follow-up surveys for the blunt-nosed leopard lizard, Nelson's Antelope squirrel, and San Joaquin kit fox next spring may confirm presence of these species. Excellent habitat quality, previous records, and current research indicate that these species are most likely extant. The sites are characterized by low to moderate densities of shrubs, and a low, open herbaceous ground cover. Such conditions are optimal for use by blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrels, and San Joaquin kit foxes. The protection of the Davis property would add value to the nearby properties (Kern NWR and CDFW properties to the south) and help establish a large, connected conservation unit.

Future coordination with agency personnel will be critical to developing a conservation easement on the property and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Davis Property (158 acres)	
Resource Type	**Acreage Available**
Wetlands	
Vernal pool	28.3 ac
Seasonal wetland	4.1 ac
Riverine	N/A
Wildlife	
vernal pool fairy shrimp	32.4 ac
vernal pool tadpole shrimp	N/A
blunt-nosed leopard lizard	158 ac
Swainson's hawk	158 ac
western burrowing owl	158 ac
Nelson's antelope squirrel	158 ac
Tipton kangaroo rat	158 ac
San Joaquin kit fox	158 ac
ac = acres N/A = not applicable	



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

Source: Bing Imagery maps, CNDDB 2012

October 4, 2012

Special-status species

- Blunt-nosed leopard lizard
- Burrowing owl
- Nelson's antelope squirrel
- San Joaquin kit fox
- Swainson's hawk
- Tipton kangaroo rat

- Parcel boundary
- 5-mile buffer
- Public Lands
- Semitropic Ecological Reserve

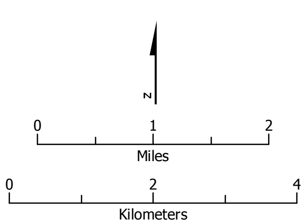


Figure 1
CNDDB occurences and critical habitat
Davis property

PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

October 3, 2012

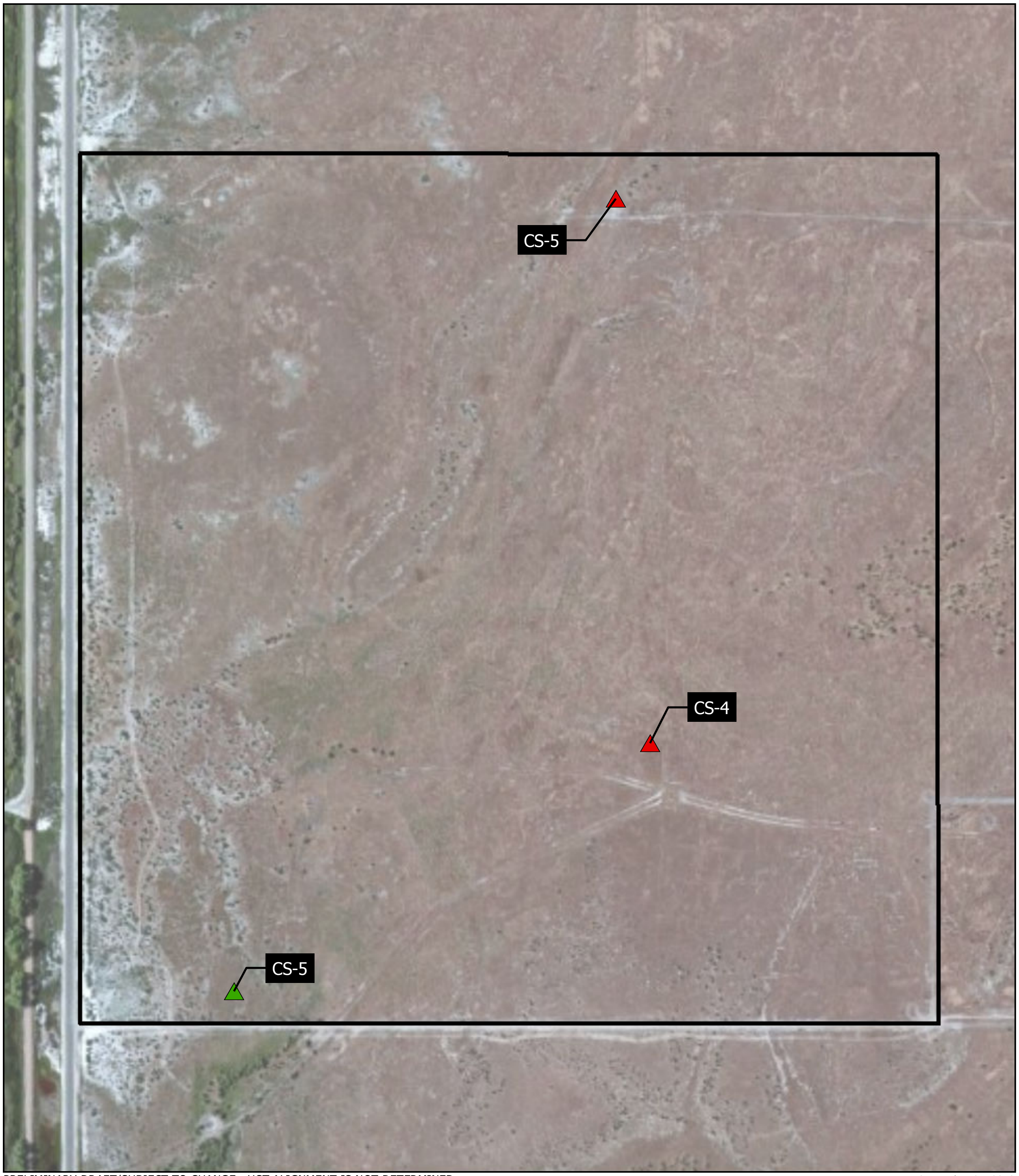
N

0 250 500
Feet

0 125 250
Meters

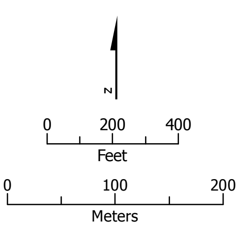
Parcel boundary
Vernal swale
Depressional wetland

Figure 2
Wetland survey map
Davis property



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Data source: URS, GPS Data 2013

September 24, 2013



Parcel Boundary

Camera Station 2012

Camera Station 2013

Figure 3
Special-status species survey results
Davis property

C3.0 Staffel Family Trust Property

The Staffel property was identified as a candidate mitigation property as part of a mitigation site selection analysis. In response to a Permission-to-Enter mailing initiated in November 2011, landowner John Staffel responded, granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable mitigation resources onsite. After the initial reconnaissance-level survey was performed, in March 2012 the landowner was contacted to confirm his interest in pursuing compensatory mitigation with the Authority at this location, and in May 2012 title reports were requested for the APN under investigation. The Authority and its consultants have continued to work with John Staffel through the coordination of wetland delineation, CRAM assessment, and focused protocol-level surveys in 2012.

The Staffel Family Trust (Staffel) property consists of a single assessor parcel number (APN) in Kern County. This parcel is moderate in size (61.2 acres), is predominantly undisturbed, and shows evidence of intact, natural communities, including alkali desert scrub, annual grassland, and vernal pool complexes (see photo, below). The parcel is bounded by rural, unnamed dirt roads that provide access to the adjacent agricultural fields (Figure 1). The parcel is south of the Allensworth Ecological Reserve and is surrounded by a combination of relict natural lands (to the east and west) and former natural alkali desert scrub and annual grassland that has been converted for agricultural use in the last few years. The Staffel property is separated from the Allensworth Ecological Reserve by an at-grade, two-track dirt road that creates a small break in vernal pool habitat but does not impede hydrologic or terrestrial connectivity.

Together with the Allensworth Ecological Reserve and the Yang property (a 316.4-acre property also under consideration as a proposed mitigation property), the Staffel property and the surrounding natural lands provide approximately 1,790 acres of contiguous open space west of State Route 43 suitable for special-status plant and wildlife species. The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. In the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Staffel property is situated along the boundaries of the Sand Ridge–Tulare Lake and Goose Lake planning areas where various wildlife and wetland conservation projects have been proposed or are under consideration. In a meeting with the URS/HMM/Arup Joint Venture on April 28, 2010, biologist Krista Tomlinson of the California Department of Fish and Wildlife (CDFW) indicated a specific interest in purchasing the nearby Yang property to expand the existing Allensworth Ecological Reserve.

C3.1 Wetland Resources

C3.1.1 Reconnaissance Surveys and Condition Assessment

The Staffel property is within the Upper Deer–Upper White HUC-8 watershed. The property features vernal pools that are relatively intact, showing signs of surface drainage features, dried salt crusts, and soil cracking (Figure 2). Site visits conducted in 2010 and 2012 confirmed the extent of these undisturbed vernal pools in the northern portion of the property and

identified small scattered depressional seasonal wetlands. However, these site visits also indicated that more than 75% of the property is upland. The vernal pools are part of a larger vernal pool network that extends offsite, and that receives surface flow from the Allensworth Ecological Reserve, which enters at the northern boundary of the Staffel property.

In 2012, the California Rapid Assessment Method (CRAM) was conducted on the Staffel property. Two large individual vernal pool Assessment Areas (AAs) were evaluated. Both AAs received moderately high AA overall CRAM scores (70.2, and 77.5). Among the four attributes evaluated under CRAM, both AAs received relatively high scores for the Buffer and Landscape Context and Hydrology attributes, and both scored lowest on the Physical Structure attributes because both structural patch richness and topographic complexity were lacking. One AA scored relatively low on the Biotic Structure attribute because it had little horizontal interspersion and zonation. The other AA received a moderately high Biotic Structure attribute score because it had a large number of co-dominant plant species.

On February 12, 2013, RC biologists visited the site with Zach Simmons (USACE) and Clifford Meek (EPA). During the site visit the USACE indicated that the threat of land conversion in the area is sufficient to justify USACE accepting the preservation of the existing features as part of the mitigation palette.

C3.1.2 Environmental Stressors

No evidence of previous farming or grazing was apparent during the site visits. The stressors identified by CRAM include the presence of orchards on parcels south of the Staffel property. In addition, the presence of trash and refuse, including plastic buckets, oil drums, and discarded appliances and furniture, may negatively affect the physical structure of the onsite wetlands. Other environmental stressors include adjacent roadways and invasive nonnative vegetation.

C3.2 Wildlife Assessment

C3.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on December 28, 2011, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Staffel property were alkali desert scrub, which supports a vernal pool complex and depressional wetland features. This parcel is adjacent to existing protected natural lands (the Allensworth Ecological Reserve) and lies within the San Joaquin Kit Fox Southwestern Tulare County Satellite Area and the Deer Creek–Sand Ridge and Highway 43–Garces Highway missing linkages. The natural vegetation communities on the property provide relatively undisturbed, high-quality habitat suitable for vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the property (Figure 3).

C.3.2.2 Desktop Review

RC GIS specialists conducted a CNDDB query at a 5-mile buffer for the species requiring mitigation (Figure 1). Vernal pool fairy shrimp have been confirmed to be present at the Allensworth Ecological Reserve. The next-closest reported observation of this species is in the Pixley National Wildlife Refuge, which is approximately 8 miles to the north. Unidentified fairy shrimp were observed in various vernal pool complexes within the Yang property in 2010, and

given the hydrologic connectivity of the property to the Yang property and the Allensworth Ecological Reserve, it is reasonable to infer that vernal pool fairy shrimp could be present onsite.

Blunt-nosed leopard lizards were last reported immediately to the north in the Allensworth Ecological Reserve, in the Yang property, and in the adjacent natural lands to the west in 2005. The alkali desert scrub and annual grasslands on the Staffel property provide suitable habitat for the species, and no impediments to movement are present between the property, the Allensworth Ecological Reserve, and adjoining natural lands. CDFW confirms that we can infer presence for blunt-nosed leopard lizard but we may need to further document presence for FWS approval.

The closest reported Swainson's hawk observations are approximately 8.6 miles to the northwest of the Staffel property (in 2000) and approximately 11 miles to the west (in 1994). Although no mature trees are present on the property, the surrounding alkali desert scrub, annual grasslands, and agricultural lands provide suitable foraging habitat for the species. CDFW presumes that Swainson's hawks are present in the Allensworth Ecological Reserve and could be encouraged to nest and forage onsite through the installation of artificial nest platforms.

Multiple western burrowing owl observations were reported on the property and at the Allensworth Ecological Reserve in 2004 and 2005.

The closest reported Nelson's antelope squirrel observations are approximately 1.5 miles west and southwest (in 1988), and CDFW presumes that the species is present at the Allensworth Ecological Reserve. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

Tipton kangaroo rats were last reported on the Staffel property, immediately to the east in the Allensworth Ecological Reserve, and on the surrounding properties to the west and south in 1985. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species, and small-mammal tracks and tail drags were observed onsite, suggesting occupancy by kangaroo rats.

San Joaquin kit foxes were last reported on the Staffel property in 1988; additional observations were reported in the region in 1975 and 2004. The alkali desert scrub and annual grasslands on the property provide suitable denning and foraging habitat for the species. Suitably-sized burrows that could provide denning habitat for this species were observed on the adjacent Yang property. Also, the signs of small-mammal (*Dipodomys* sp.) occupancy that were observed onsite, including tail drags and small-mammal burrows, are evidence of the availability of the prey base necessary to support and sustain resident kit foxes.

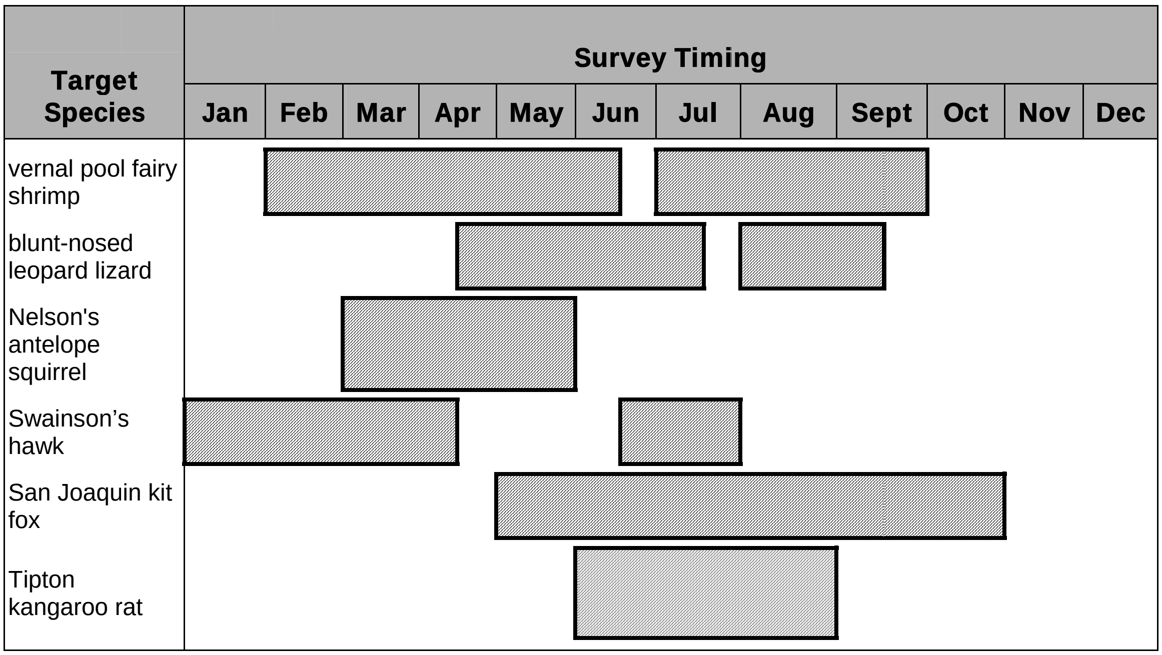
Special-status and other common species observed on the Staffel property between 2010 and the present were indicative of the natural conditions present on the adjoining Yang property and include unidentified fairy shrimp, spadefoot toad (*Scaphiophus hammondi*) tadpoles and adults, coast horned lizard (*Phrynosoma coronatum*), California whiptail (*Cnemidophorus tigris mundus*), unidentified kangaroo rat (*Dipodomys* sp.) signs, and fresh American badger (*Taxidea taxus*) burrowing activity. At the adjacent Allensworth Ecological Reserve, CDFW has also confirmed or presumes the presence of the following special-status species: San Joaquin whipsnake (*Masticophis flagellum ruddocki*) (presumed), golden eagle (*Aquila chrysaetos*), loggerhead shrike (*Lanius ludovicianus*), San Joaquin kit fox (presumed), and San Joaquin pocket mouse (*Perognathus inornatus*) (presumed).

C.3.2.3 Focused Wildlife Surveys

RC biologists met with CDFW representatives on June 6, 2012, to discuss the potential mitigation sites and agencies' determination of current species presence. For the Staffel property, the CDFW

requested surveys for Nelson's antelope squirrel. Based on recent known species observations, CDFW inferred presence for the blunt-nosed leopard lizard, Swainson's hawk, burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox.

In August 2012, RC biologists conducted focused surveys to determine the presence of special-status wildlife species at the Staffel property. Surveys consisted of small-mammal trapping, a camera trapping station, and pedestrian surveys to identify other special-status wildlife species. The surveys were conducted between August 7 and 21, 2012, to coincide with the survey windows (see table below) for blunt-nosed leopard lizard, San Joaquin kit fox, and Tipton kangaroo rat.



During the surveys, RC biologists used the following criteria from the previous reconnaissance survey to identify appropriate target survey areas within these properties:

- Presence of small-mammal burrow complexes.
- Presence of kangaroo rat sign (e.g., burrows in sandy soil, dust bath areas, tail drags).
- Proximity to known populations of special-status species.
- Habitat integrity.

Methods

Dry-season Sampling: On September 19, 2012, a RC biologist with a USFWS Section 10(a)(1)(A) Recovery Permit for federally listed branchiopods conducted dry-season soil sampling. Additional staff worked with the permitted individual in accordance with the recovery permit. Branchiopod cyst sampling consisted of identifying the vernal pools believed to be the most likely to support vernal pool branchiopods and collecting soil samples along transects within the pool. The samples were collected into clean, airtight containers for transport to a laboratory for future identification. Biologists took relevant data and representative GPS points for each soil sample.

Dry season soil samples collected previously are currently being processed in the laboratory. The process involves using water and soil sieves to isolate the branchiopod (fairy and tadpole shrimp) cysts (resting eggs) from the soil matrix. We have not yet processed soil samples from the Staffel

parcel but based on habitat and proximity to the Yang parcel, where numerous cysts were found, we expect to find abundant cysts at Staffel. Cysts isolated from the soil samples will be sent to a genetics laboratory at California State University, Los Angeles, where viable embryos will be extracted from the cysts, DNA will be extracted from the embryos, and a genetic analysis will be conducted to make a more definitive species identification than can be determined morphologically.

Small-Mammal Trapping

August 2012: Live-trapping was conducted according to Tipton kangaroo rat survey protocols as described in CDFW's "Region 4 approved survey methodologies for sensitive species" (CDFG 1990), as well as protocols outlined in the USFWS Section 10(a)(1)(A) Recovery Permit for federally listed small-mammal species of the Central Valley. All surveys were conducted under the supervision of ESRP biologists Brian Cypher and Christine Van Horn Job under a USFWS Section 10(a)(1)(A) Recovery Permit for the federally listed Tipton kangaroo rat.

Modified Sherman aluminum box traps were deployed at approximately 15-meter intervals along two transects; a total of 30 traps were distributed.. Traps were provisioned with millet seed (bait) and a paper towel (bedding). Two transects with 15 traps each (Figure 3) were set out on 7 August 2012 and checked on 8, 9, and 10 August for a total of 90 trap nights.

A detailed description of small-mammal trapping methods is provided in the ESRP memorandum (Appendix D).

Camera Trapping

August 2012: A heat and motion-triggered digital camera trap was installed, corresponding with active burrows, game trails, or other sign to detect blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrel, Tipton kangaroo rats, and San Joaquin kit fox (Figure 3). The station was baited with cat food and oats. Camera station 6 was set on August 11, 2012, and removed on August 21, 2012. All photos were inspected visually and digitally catalogued in a database.

Spring 2013: Two camera stations were set up in April 2013 on the Staffel property. Both stations were baited with cat food and an peanut butter / oat mix. Camera station 1 (CS1) was set up on April 15 and removed on May 1. The second camera station (CS8) was established on April 17 and also removed on May 1.

Pedestrian Surveys

August 2012: RC biologists conducted pedestrian surveys for evidence or direct observation of blunt-nosed leopard lizards, Swainson's hawks, Tipton kangaroo rats, and San Joaquin kit foxes. Although surveys were not performed in strict accordance with agency-approved protocols, three of the biologists (Jolie Hendricks, Melissa Newman, and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Biologists walked random transects and noted all vertebrate species observed. All sign (burrows, tracks, bones, scat) that may indicate presence of listed species was photographed and/or recorded with a GPS point. Scat of appropriate shape and size for kit fox was collected and recorded (location, date), and placed in a brown paper bag to keep the sample from molding or decaying. All scat samples were sent to Dr. Ben Sacks, Canid Diversity and Conservation Unit Center for Veterinary Genetics at UC Davis for genetic analysis.

During the cumulative site visits, all of the parcel perimeters were driven and approximately 20% of the property was covered on foot. Biologists conducted nighttime spotlighting along the western side of the property on August 7, 2012. Spotlight surveys begin approximately one hour

after sunset. Biologists slowly drove the roads while using high-powered spotlights to scan habitat. The light illuminates the movement and shape of animals and their eyeshine, making them very visible. To the extent possible, all eye shine detected during spotlighting surveys was identified to species. The spotlight route was clearly marked on a map and species data were recorded.

Spring 2013: Site visits were made on the evenings of April 15 and April 17. Biologists conducted nighttime spotlighting along the western side of the property on April 17, 2013. Spotlight surveys begin approximately 1 hour after sunset. All vertebrate species observed were identified and tallied.

Results

Dry-Season sampling

Eight bags of soil were collected from the Staffel property. These samples were carefully labeled and stored in airtight containers and are currently being processed.

Small-Mammal Trapping

Captures included two Heermann's kangaroo rats (*Dipodomys heermani*), two San Joaquin pocket mice (*Perognathus inornatus*), and 1 deer mouse (*Peromyscus maniculatus*). No Tipton kangaroo rats were captured (Figure 3).

Camera Trapping

August 2012: The camera trapping effort totaled 2 trap nights and 2,214 images. There were no detections.

Spring 2013: Camera trapping resulted in a total of 28 trap nights, with 2,855 images recorded. The detections included American badger (*Taxidea taxus*), common ravens, jackrabbits, coyotes, and an unidentified mouse. Badger sign has been seen on the Staffel and Yang properties, but the photo served as confirmation that they have been active on the property recently.

Pedestrian Surveys

August 2012: During meandering transect surveys, biologists noted multiple animal species onsite. Biologists did not observe Swainson's hawks, Nelson's antelope squirrels, or San Joaquin kit fox. Biologists did find a juvenile coast horned lizard (*Phrynosoma blainvilli*) along one of the small-mammal trapping transects. No usable DNA was recovered from the potential San Joaquin kit fox scat to permit genetic analysis.

Spring 2013: Biologists observed burrowing owl chicks near to the Staffel site in May. An adult blunt-nosed leopard lizard was observed on the contiguous, adjacent Yang property. On that property, we also identified a San Joaquin coachwhip (*Masticophis flagellum ruddocki*). During nighttime spotlight surveys, biologists noted 11 jackrabbits, 2 cottontails, 2 burrowing owls, and 2 coyotes. An additional, unidentified canid was encountered, but we were unable to get a positive identification.

The presence of blunt-nosed leopard lizards and numerous species of special concern on the Staffel and nearby Yang property, including coast horned lizards, San Joaquin coachwhip, burrowing owls, and American badgers, indicates that the Staffel property is extremely valuable to wildlife. A list of the wildlife species observed on or near the Staffel property is provided in the table below.

Class	Common Name	Scientific Name
reptiles	common side-blotched lizard	*Uta stansburiana*
	coast horned lizard	*Phrynosoma coronatum*
	tiger whiptail	*Aspidocelis tigris*
	blunt-nosed leopard lizard	*Gambelia sila*
	San Joaquin coachwhip	*Masticophis flagellum ruddocki*
birds	great egret	*Ardea alba*
	turkey vulture	*Cathartes aura*
	northern harrier	*Circus cyaneus*
	red-tailed hawk	*Buteo jamaicensis*
	killdeer	*Charadrius vociferus*
	mourning dove	*Zenaida macroura*
	barn owl	*Tyto alba*
	burrowing owl	*Athene cunicularia*
	American kestrel	*Falco sparverius*
	western kingbird	*Tyrannus verticalis*
	loggerhead shrike	*Lanius ludovicianus*
	common raven	*Corvus corax*
	northern mockingbird	*Mimus polyglottos*
	European starling	*Sturnus vulgaris*
	American pipit	*Anthus rubescens*
	savannah sparrow	*Passerculus sandwichensis*
	red-winged blackbird	*Agelaius phoeniceus*
	western meadowlark	*Sturnella neglecta*
	house finch	*Haemorhous mexicanus*
mammals	California ground squirrel	*Otospermophilus beecheyi*
	deer mouse	*Peromyscus maniculatus*
	Heerman's kangaroo rat	*Dipodomys heermanni*
	San Joaquin pocket mouse	*Perognathus inornatus inornatus*
	desert cottontail	*Sylvilagus audubonii*
	black-tailed jackrabbit	*Lepus californicus*
	American badger	*Taxidea taxus*
	coyote	*Canis latrans*

Summary

A summary of species presence, either confirmed or presumed, on the Staffel property is provided here.

- Vernal pool fairy shrimp have been confirmed to be present at the Allensworth Ecological Reserve, which is hydrologically connected to the Staffel property. During 2012, RC biologists observed unidentified fairy shrimp in vernal pool complexes within the adjacent Yang property. Based on these survey results and agency coordination, the vernal pool fairy shrimp are likely present on the Staffel property. The dry-season samples will be processed to confirm this presence.

- Blunt-nosed leopard lizard: There were no blunt-nosed leopard lizards seen at the Staffel property but the species was observed at the nearby Yang property in both 2012 and 2013. Habitat conditions are optimal for this species. Adults and juveniles have been observed at the nearby Yang property, confirming that a breeding population of the species occurs on the Yang property or in the vicinity.

- Swainson's hawks: No Swainson's hawks were observed. Red-tailed hawk observations indicate the property may support Swainson's hawk. Abundant small-mammal activity provides a good prey base for hawks.

- Burrowing owl: Numerous owls and extensive burrows were observed during surveys; the presence of young owls nearby confirms that they are breeding in this area. California ground squirrels are relatively common onsite, providing burrow complexes for the owls.

- Nelson's antelope squirrel: This species is most active during the spring. Surveys did not detect antelope squirrels but the habitat – open, with sparse vegetation – is highly suitable for the species (Brian Cypher, personal communication, September 20, 2012). Focused surveys could be conducted for NAS to determine current presence. If this species is not present, then the site would be an excellent reintroduction sites.

- Tipton kangaroo rat: No Tipton kangaroo rat captured onsite. The habitat is optimal for the species and presumed present. Brian Cypher confirms that the potential for Tipton kangaroo rat occupancy is high. Lack of trap captures may be due to high temperatures and decreased activity periods, or transects may have not intersected Tipton kangaroo rat microhabitats.

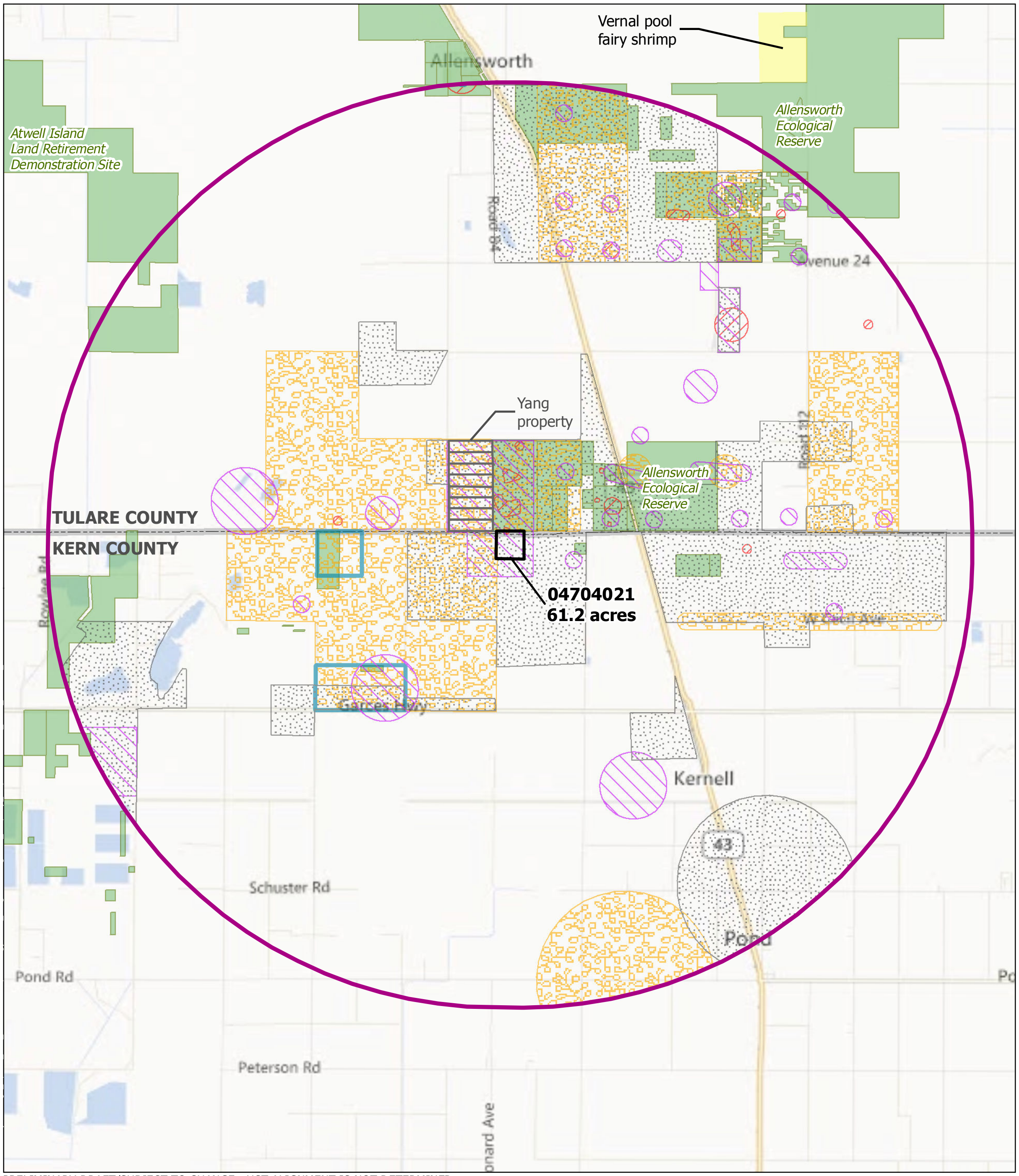
- San Joaquin kit fox: Usable DNA was not recoverable from the scat collected on the property. Brian Cypher (personal communication, September 20, 2012) notes that Staffel provides highly suitable habitat and is contiguous with suitable habitat in the region and therefore, there is a high potential for kit foxes onsite. The condition of the habitat on the Staffel property is excellent and exhibits little sign of any anthropogenic modification. The site is characterized by low to moderate densities of shrubs, and a low, open herbaceous ground cover. Such conditions are optimal for use by San Joaquin kit fox. Furthermore, the sites are in an area where habitat is being protected in an effort to provide connectivity for San Joaquin kit fox between Allensworth Ecological Reserve and associated lands to the north, and conserved lands to the southwest in and around the North Semitropic Ecological Reserve and the Kern National Wildlife Refuge.

C3.3 Next Steps

Aquatic and upland habitats on the property provide suitable opportunities for enhancement (garbage removal and vegetation management) and preservation. Hydrological modifications on the property may establish or enhance connectivity with the adjacent Allensworth Ecological Reserve. If warranted, Swainson's hawks could be encouraged to nest and forage onsite through tree plantings.

Future coordination with agency personnel will be critical to develop a conservation easement on the property and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Staffel Family Trust Property (61.2 acres)	
Resource Type	**Acreage Available**
Wetlands	
Vernal pool	2.8 ac
Seasonal wetland	0.1 ac
Riverine	N/A
Wildlife	
vernal pool fairy shrimp	2.9 ac
vernal pool tadpole shrimp	2.9 ac
blunt-nosed leopard lizard	61.2 ac
Swainson's hawk	61.2 ac
western burrowing owl	61.2 ac
Nelson's antelope squirrel	61.2 ac
Tipton kangaroo rat	61.2 ac
San Joaquin kit fox	61.2 ac
ac = acres N/A = not applicable	



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: Bing Imagery maps, CNDDB 2012

October 15, 2012

Special-status species

- Blunt-nosed leopard lizard
- Burrowing owl
- Nelson's antelope squirrel
- San Joaquin kit fox
- Tipton kangaroo rat

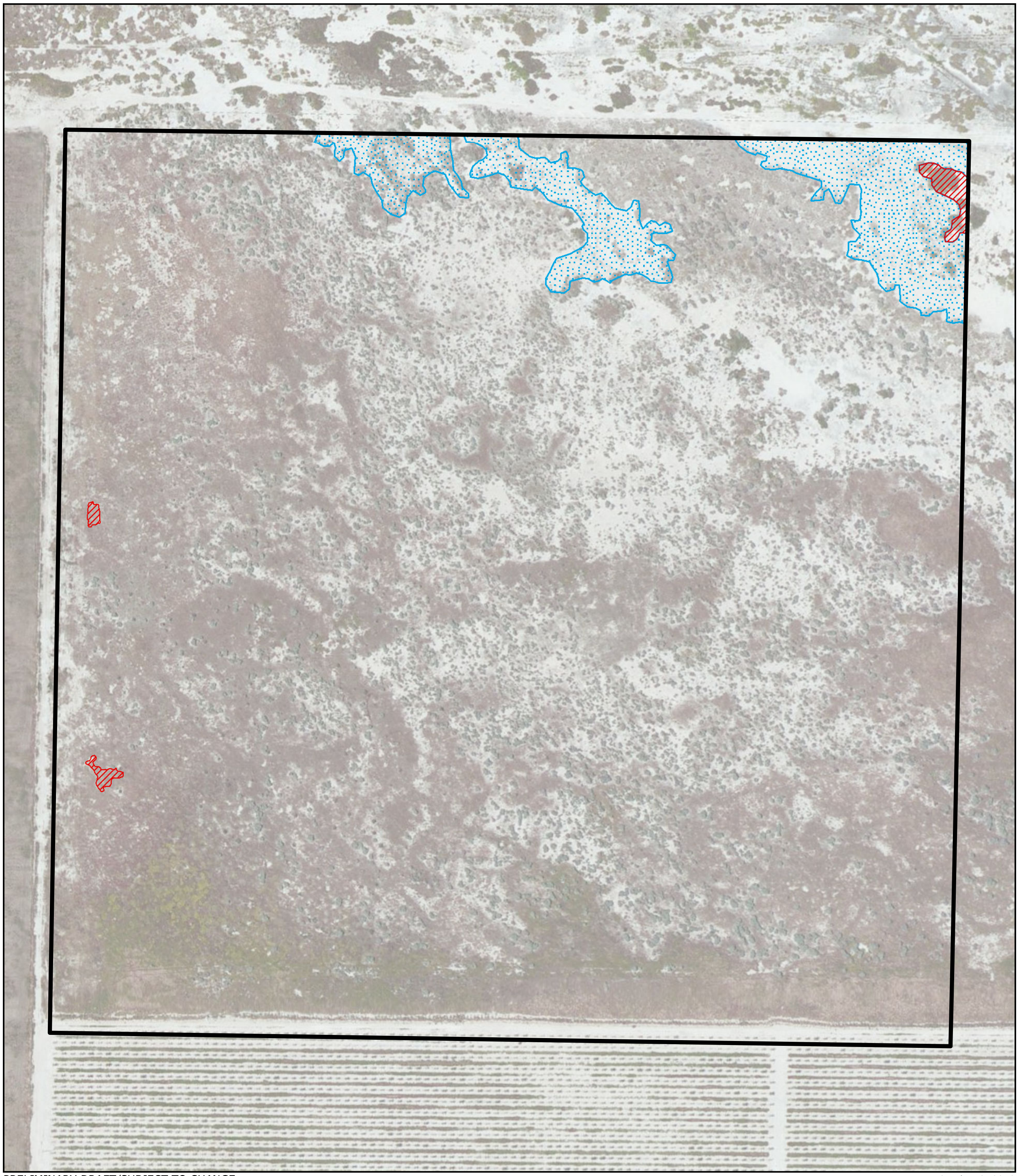
- Parcel boundary
- 5-mile buffer
- Public lands
- Critical habitat

N

0 1 2
Miles

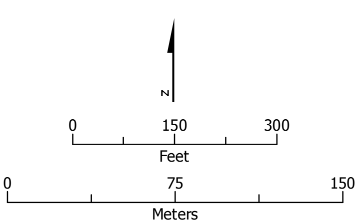
0 2 4
Kilometers

Figure 1
CNDDB occurences and critical habitat
Staffel property



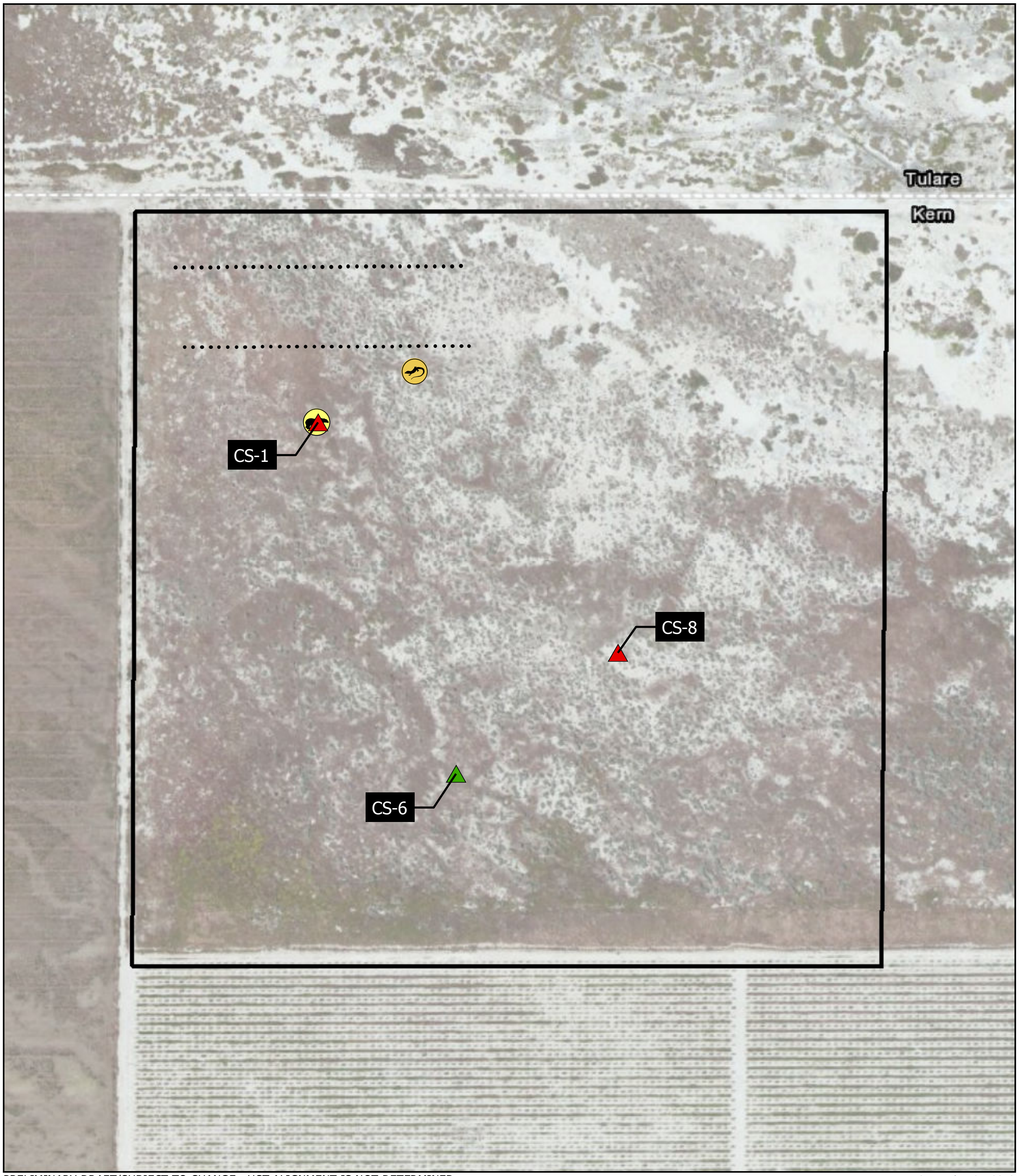
PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

October 3, 2012



Parcel boundary
Vernal pool
Depressional wetland

Figure 2
Wetland survey map
Staffel property



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Data source: URS, GPS Data 2013

September 24, 2013

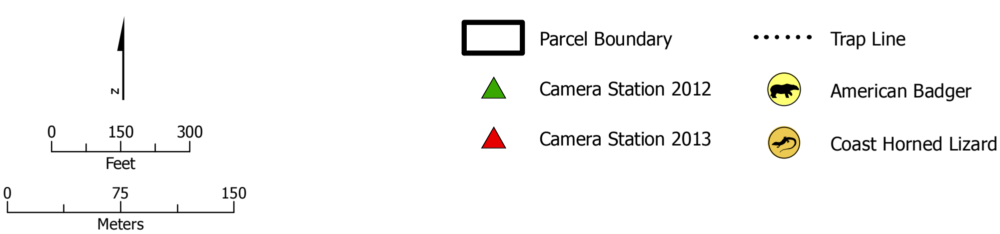


Figure 3
Special-status species survey results
Staffel property

C4.0 Valadez Property

The Valadez property was identified as a candidate mitigation property as part of a mitigation site selection analysis. In response to a Permission-to-Enter mailing initiated in November 2011, landowners Elias and Carolina Valadez responded granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable mitigation resources onsite. After the initial reconnaissance-level survey was performed, in March 2012 the landowners were contacted to confirm their interest in pursuing compensatory mitigation with the Authority at this location, and in May 2012 title reports were requested for the APN under investigation. The Authority and its consultants have continued to work with the Valadez family through the coordination of wetland delineation, CRAM assessment, and focused protocol-level surveys in 2012.

The Valadez property consists of a single assessor parcel number (APN) in Kern County. The parcel is large (120 acres), moderately disturbed, and shows evidence of intact natural communities, including alkali desert scrub, annual grassland, and vernal pools. The parcel is

surrounded by the Semitropic Ecological Reserve to the north, east, and west and open space to the south. Corcoran Road lies to the east. The Semitropic Ecological Reserve is characterized by alkali desert scrub and annual grasslands. The parcel abuts the Semitropic Ecological Reserve, but is fenced along the perimeter, which could impede terrestrial, but not hydrologic connectivity. Together with the Semitropic Ecological Reserve, the Kern National Wildlife Refuge, and the Davis property (a 158-acre parcel also under consideration as a proposed mitigation property), the Valadez property and the surrounding natural lands provide more than 50,000 acres of contiguous open space east of Interstate 5 suitable for special-status plant and wildlife species (Figure 1). The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. Within the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Valadez property is situated within the Goose Lake planning area, where various wildlife and wetland conservation projects have been proposed or are under consideration.

C4.1 Wetland Resources

C4.1.1 Reconnaissance and Condition Assessment

The Valadez property is within the Tulare–Buena Vista Lakes HUC-8 watershed. The property features surface drainage, a man-made wetland basin, and vernal pools that are located in the northern portion of the site (Figure 2). The wetland basin is a large, deep, man-made feature that appears to no longer be used for any water-holding purposes. The vernal pools are in the northwest corner of the property and extend offsite onto the property to the north of the Valadez parcel. The wetland features on the property constitute less than 10% of the area. Site visits conducted in 2012 verified the extent of the wetlands.

In 2012, the California Rapid Assessment Method (CRAM) was conducted on the Valadez property. One depressional wetland Assessment Area (AA) in the man-made wetland basin and one individual vernal pool AA were evaluated. Both AAs received relatively low overall CRAM scores (58.5 and 57.7 out of 100, respectively) and received low scores for three of the four CRAM attributes. The exception was the Hydrology attribute, for which the individual vernal pool AA received a high score. Despite disturbed site conditions, the AA showed evidence of a natural hydrology regime.

RC biologists were unable to visit this site with Zach Simmons (USACE) and Clifford Meek (EPA). However, conversations with the USACE indicated that the threat of land conversion in the area is not sufficient to justify USACE accepting the preservation of the existing features as part of the mitigation palette.

C4.1.2 Environmental Stressors

The stressors identified by CRAM include the close proximity of operational facilities (including a septic system and residential buildings), grading/compaction of the adjacent upland areas, and Corcoran Road (which is serving as a transportation corridor). Additional environmental stressors include light/moderate grazing, off-road vehicle use, invasive non-native vegetation, garbage and debris, and fencing.

C4.2 Wildlife Assessment

C4.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on December 29, 2011, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Valadez property were alkali desert scrub and annual grasslands, which support vernal pools and depressional wetland features. This parcel is surrounded by existing protected natural lands (the Semitropic Ecological Reserve) and lies at the epicenter of the following wildlife movement areas in the Central Valley: the California Essential Habitat Connectivity Corridor; the San Joaquin Kit Fox Northwestern Kern County Satellite Area; and at the junction of the Highway 43–Garces Highway, Poso Creek, Kern Refuge–Semitropic Ridge, Deer Creek–Sand Ridge, and Lost Hill–Semitropic Ridge missing linkages. The natural vegetation communities on the property provide moderately disturbed habitat suitable for vernal pool fairy shrimp (*Branchinecta lynchi*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the property.

C4.2.2 Desktop Review

Vernal pool fairy shrimp have not been recorded within a 5-mile radius of the Valadez property.

The closest reported blunt-nosed leopard lizard observations are 0.25 mile south of the property (in 2006), 1.75 miles northeast, on the Davis property (in 1974 and 1985), and approximately 2.69 miles northeast, in the surrounding natural lands in the Semitropic Ecological Reserve (in 1974). The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

The closest reported Swainson's hawk observation was in 2004 approximately 5.5 miles to the north. Mature trees near the buildings on the property could provide suitable nesting habitat for nesting pairs, and the surrounding annual grasslands provide suitable foraging habitat for the

species. Swainson's hawk has been confirmed at Kern National Wildlife Refuge. Although suitable nest trees are limited on the property, Swainson's hawks could be encouraged to nest and forage on the property by tree planting.

The closest reported western burrowing owl observation was 0.6 mile west of the property (in 2004); additional observations have been reported in the region in 2004, 2006, and 2007. Burrowing owls have been confirmed to be nesting at Kern National Wildlife Refuge. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

The closest reported Nelson's antelope squirrel observations were approximately 0.7 mile south of the property (in 2007), and the species has been confirmed at the Kern National Wildlife Refuge. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

Tipton kangaroo rats were last reported on the Valadez property and the surrounding properties in 2007. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species, and small-mammal tracks and tail drags were observed onsite, suggesting occupancy by kangaroo rats.

San Joaquin kit foxes were last reported on the Valadez property in 2007; additional observations have been reported throughout the surrounding natural lands in the region, and Kern National Wildlife Refuge staff has confirmed the presence of this species in the refuge in recent years. The alkali desert scrub and annual grasslands on the property provide suitable denning and foraging habitat for this species.

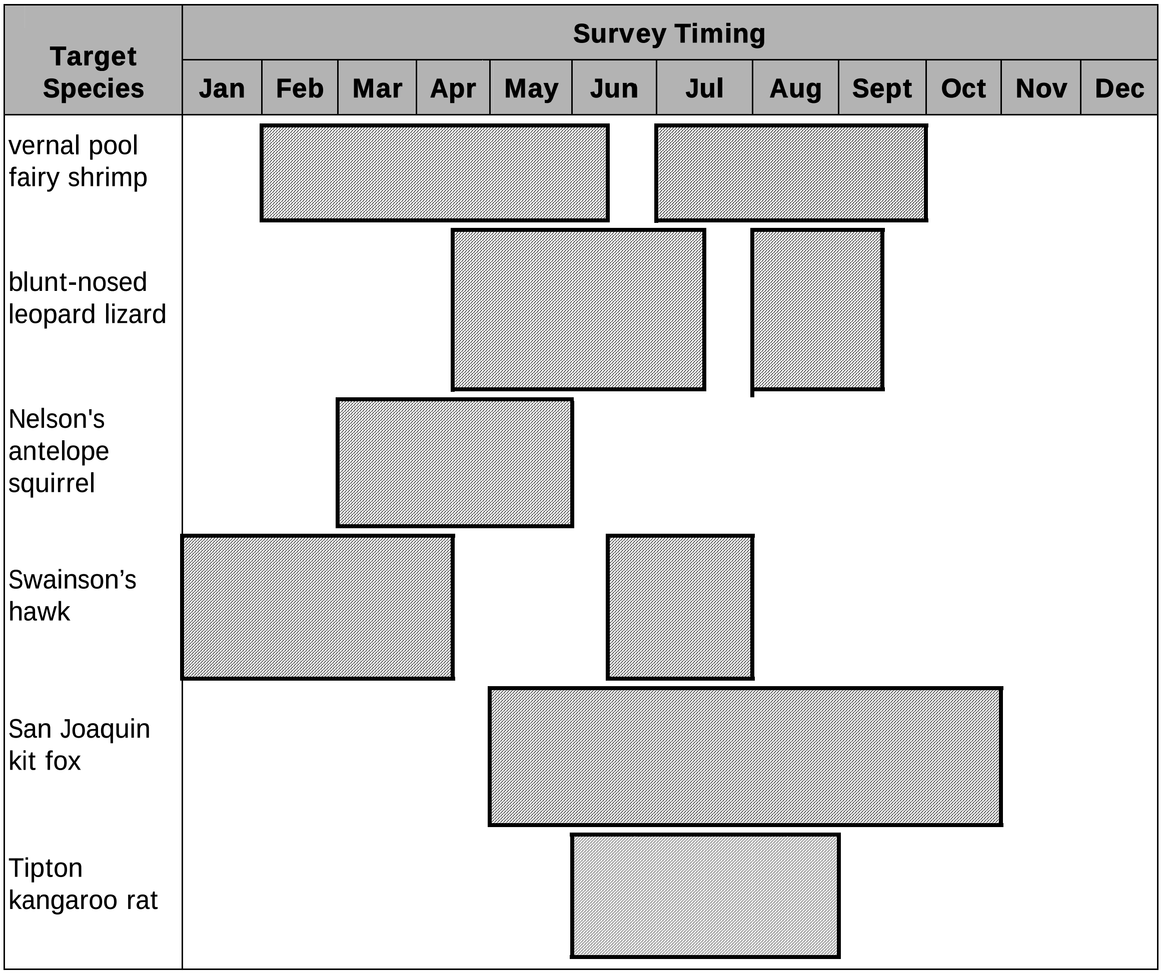
C4.2.3 Focused Wildlife Surveys

RC biologists met with CDFW representatives on June 6, 2012, to discuss the potential mitigation sites and agencies' determination of current species presence. For the Valadez property, the CDFW requested surveys for blunt-nosed leopard lizard and Nelson's antelope squirrels. CDFW confirmed Tipton kangaroo rats and San Joaquin kit fox are present onsite. They agreed that foraging and potential nesting habitat is present for Swainson's hawk but are interested in more recent documentation. USFWS concurrences with CDFW determinations are pending.

In August 2012, RC biologists conducted focused surveys to determine the presence of special-status wildlife species at the Valadez property. Surveys consisted of a camera trapping station and pedestrian surveys. The surveys were conducted between August 6 and 21, 2012, to coincide with the survey windows (see table below) for blunt-nosed leopard lizard.

During the surveys, RC biologists used the following criteria from the previous reconnaissance survey to identify appropriate target survey areas within these properties:

- Presence of small-mammal burrow complexes.
- Presence of kangaroo rat sign (e.g., burrows in sandy soil, dust bath areas, tail drags).
- Proximity to known populations of special-status species.
- Habitat integrity.



Methods

Dry-Season Sampling

On September 19, 2012, an RC biologist with a USFWS Section 10(a)(1)(A) Recovery Permit for federally listed branchiopods conducted dry-season soil sampling. Additional staff worked with the permitted individual in accordance with the recovery permit. Branchiopod cyst sampling consisted of identifying the vernal pools believed to be the most likely to support vernal pool brachiopods and collecting soil samples along transects within the pool. The samples were collected into clean, airtight containers for transport to a laboratory for future identification. Biologists took relevant data and representative GPS points for each soil sample.

Camera Trapping

Heat and motion-triggered digital camera traps were installed at one location onsite corresponding with active burrows, game trails, or other sign to detect blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrel, Tipton kangaroo rats, and San Joaquin kit fox (Figure 3). The station was baited with cat food and oats. Camera station 4 was set on August 8, 2012, and removed on August 21, 2012. All photos were inspected visually and digitally catalogued in a database.

Pedestrian Surveys

RC biologists conducted pedestrian surveys for evidence or direct observation of blunt-nosed leopard lizards, Swainson's hawks, Tipton kangaroo rats, and San Joaquin kit foxes. Although surveys were not performed in strict accordance with agency-approved protocols, three of the biologists (Jolie Hendricks, Melissa Newman, and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Biologists walked random transects and noted all vertebrate species observed. All sign (burrows, tracks, bones, scat) that may indicate presence of listed species was photographed and/or recorded with a GPS point.

Results

Dry-Season Sampling

Six bags of soil were collected from the Valadez property. These samples were carefully labeled and stored in airtight containers, and will be analyzed to detect and identify the cysts to the level of species group at a later date if conditions in 2013 prohibit wet-season sampling.

Camera Trapping

The camera trapping effort totaled 7 trap nights and 264 images. Most of these were blank but the camera photographed domestic dogs (*Canis lupus familiaris*) and a desert cottontail (*Sylvilagus audubonii*). No kit fox or other target species were detected through photographs.

Pedestrian Surveys

During meandering transect surveys, biologists noted multiple animal species. No special-status species were observed. A summary of species recorded is provided below.

	Common Name	Scientific Name	Sign
reptiles	common side-blotched lizard	*Uta stansburiana*	observed
	tiger whiptail	*Aspidocelis tigris*	observed
birds	rock pigeon	*Columbia livia*	fly over
	loggerhead shrike	*Lanius ludovicianus*	observed
	common raven	*Corvus corax*	observed
mammals	California ground squirrel	*Otospermophilus beecheyi*	skull
	kangaroo rat	*Dipodomys spp.*	tail drags
	desert cottontail	*Sylvilagus audubonii*	camera trap
	coyote	*Canis latrans*	scat

Summary

A summary of species presence, either confirmed or presumed, on the Valdez property is provided here.

- Vernal pool fairy shrimp are not known on the Valadez property. The property's microtopography suggests that much of the land was historically suitable vernal pool habitat. Due to current land use, only small patches of suitable vernal pool habitat remain on the property.

- Blunt-nosed leopard lizard: No blunt-nosed leopard lizards were seen at the Valadez property. However, habitat conditions are optimal for this species (Brian Cypher, personal communication, September 20, 2012) and they have been seen and appear to be abundant just south of the property. Further focused surveys may confirm presence.

- Swainson's hawks: No Swainson's hawks were observed but they are present at the Kern National Wildlife Refuge. The Valadez property does not currently have suitable nesting trees but does provide foraging habitat for hawks.

- Burrowing owl: Biologists did not detect owls onsite, but the site does have appropriate habitat to support this species. They are known to reside and breed at the Kern National Wildlife Refuge directly across Corcoran Road to the west.

- Nelson's antelope squirrel: This species is most active during the spring. Surveys did not detect antelope squirrels but the habitat – open, with sparse vegetation – is highly suitable for the species (Brian Cypher, personal communication, September 20, 2012).

- Tipton kangaroo rat: CDFW presumes this species present onsite. Field surveys confirmed that the Valadez property provides high-quality habitat for the species and there are numerous burrow complexes.

- San Joaquin kit fox: Focused surveys did not detect San Joaquin kit fox on the site. ESRP is currently conducting kit fox surveys approximately a mile to the south. Those sites are connected to the Valadez property with no known barriers to dispersal. Brian Cypher (ESRP) and staff consider the species abundant in the vicinity of this property. Brian Cypher (personal communication, September 20, 2012) notes that Valadez provides highly suitable habitat and is contiguous with suitable habitat in the region and therefore, there is a high potential for kit foxes onsite.

C4.3 Next Steps

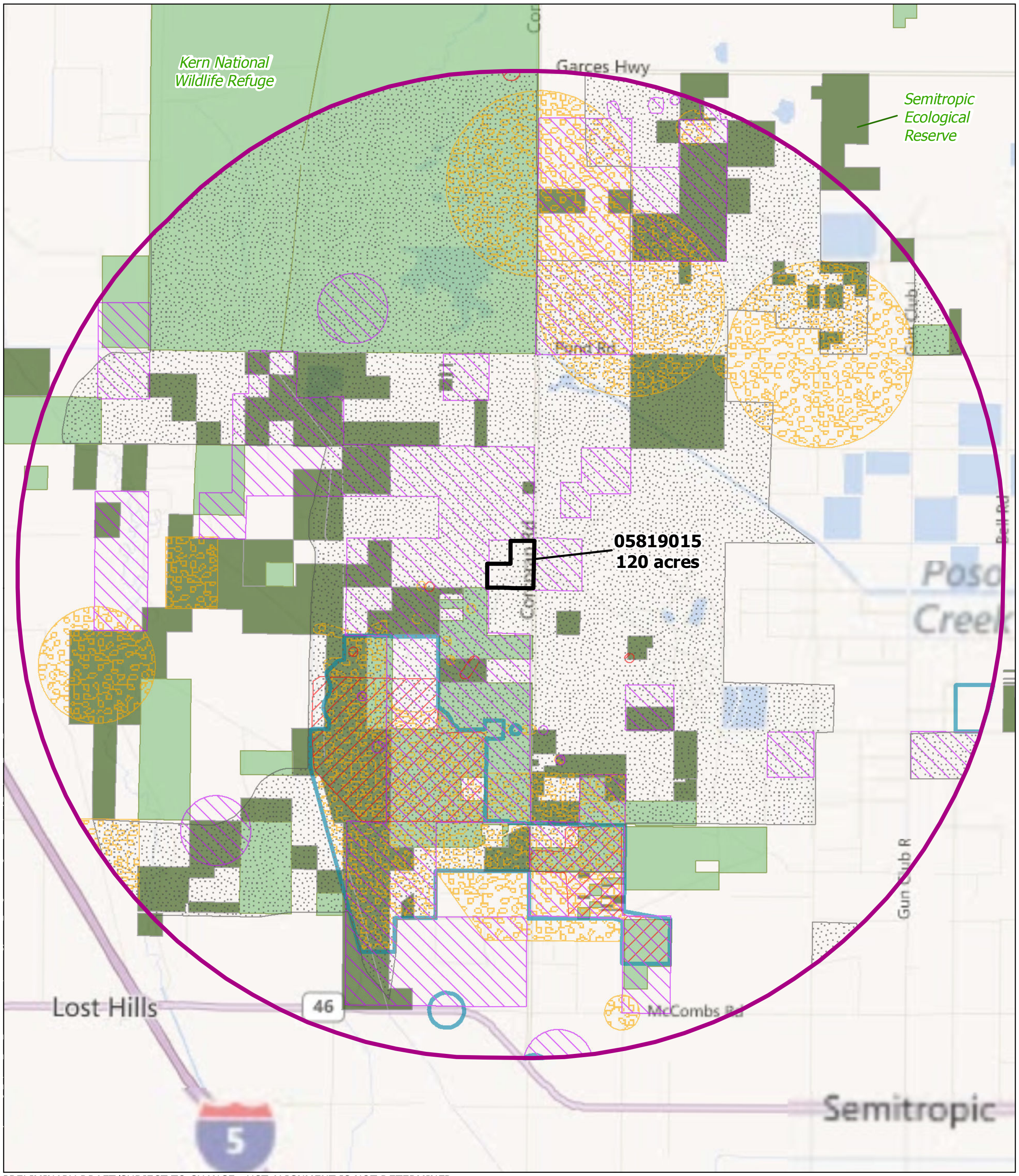
Aquatic and upland habitats on the property provide suitable opportunities for enhancement (exclusion of vehicles, grazing management, vegetation management) and preservation.

Wet season sampling for vernal pool fairy shrimp or analysis of dry-season soil samples and identification of cysts, may confirm the presence of these species at the Valadez property. Follow-up surveys for the blunt-nosed leopard lizard, Nelson's Antelope squirrel, and San Joaquin kit fox during the first two weeks of April 2013 may confirm presence of these species. Excellent habitat quality, previous records, and current research indicate that these species are most likely extant. The sites are characterized by low to moderate densities of shrubs, and a low, open herbaceous ground cover. Such conditions are optimal for use by blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrels, and San Joaquin kit foxes. The protection of the Valadez property would add value to the nearby properties (Kern NWR and CDFW properties to the south).

Future coordination with agency personnel will be critical to develop a conservation easement on the property and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Valadez Property (120 acres)	
Resource Type	**Acreage Available**
Wetlands	
Vernal pool	0.2 ac
Seasonal wetland	0.8 ac
Riverine	N/A
Wildlife	
vernal pool fairy shrimp	1.0 ac
vernal pool tadpole shrimp	N/A
blunt-nosed leopard lizard	120 ac
Swainson's hawk	120 ac
western burrowing owl	120 ac
Nelson's antelope squirrel	120 ac
Tipton kangaroo rat	120 ac
San Joaquin kit fox	120 ac

ac = acres
N/A = not applicable



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: Bing Imagery maps, CNDDB 2012

October 4, 2012

Special-status species
- Blunt-nosed leopard lizard
- Burrowing owl
- Nelson's antelope squirrel
- San Joaquin kit fox
- Tipton kangaroo rat

- Parcel boundary
- 5-mile buffer
- Public Lands
- Semitropic Ecological Reserve

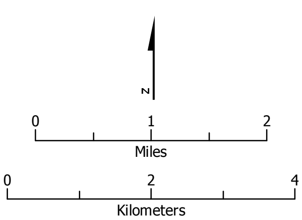


Figure 1
CNDDB occurences and critical habitat
Valadez property

PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

October 3, 2012

N

0 250 500
Feet

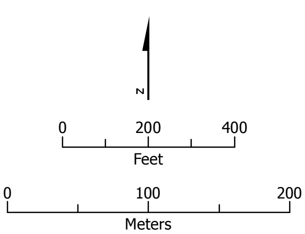
0 125 250
Meters

Parcel boundary
Depressional wetland (basin)
Vernal pool

Figure 2
Wetland survey map
Valadez property

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Data source: URS, 2012

October 15, 2012



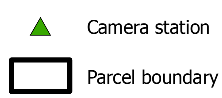


Figure 3
Special-status species survey results
Valadez property

C5.0 Yang Property

C5.1 Description

The Yang property consists of eight adjacent assessor parcel numbers (APNs) in Kings County. The eight parcels are each moderate in size (between 36 and 42 acres), totaling 316.4 acres. The properties are predominantly undisturbed, and show evidence of intact, natural communities, including alkali desert scrub, annual grassland, and vernal pools. The parcels are bounded by rural, dirt, or paved roads (Road 80 to the west, Avenue 8 to the north), the Allensworth Ecological Reserve (to the east), and a combination of relict natural lands (west of Road 80) otherwise surrounded by former alkali desert scrub and annual grassland converted to agriculture in the last few years (Figure 1). The parcels border the Allensworth Ecological Reserve without any fence lines or impediments to terrestrial or hydrologic connectivity. Together with the Allensworth Ecological Reserve and the Staffel Family Trust property (a 61-acre parcel also under consideration as a proposed mitigation property), the Yang property and the surrounding natural lands provide approximately 1,800 acres of contiguous open space west of State Route 43 suitable for special-status plant and wildlife species. The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. As described in the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Yang property is situated along the boundaries of the Sand Ridge–Tulare Lake and Goose Lake planning areas where various wildlife and wetland conservation projects have been proposed or are under consideration.

In a meeting with RC biologists on April 28, 2010, Krista Tomlinson, biologist for the California Department of Fish and Wildlife (CDFW), indicated that CDFW had a specific interest in purchasing the Yang property to expand the existing Allensworth Ecological Reserve.

C5.2 Wetland Resources

C5.2.1 Reconnaissance and Condition Assessment

The Yang property is located in the Upper Deer–Upper White HUC-8 watershed. They feature an estimated 97.7 acres of extensive, mostly undisturbed vernal pools, the presence of which was confirmed during site visits conducted in 2010 and 2012 by RC biologists (Figure 2). The complexes extend from the southeast corner across to the northwest corner where they are most densely concentrated. The parcels were dominated by saltgrass (*Distichlis spicata*), a facultative wetland species. The vernal pools are part of a large, continuous network of vernal pools extending from the Allensworth Ecological Reserve west to the Yang property and south to the Staffel Family Trust property. Following rain events, the Yang property receives direct surface flow from the Allensworth Ecological Reserve that feeds the continuous expanse of vernal pools. The hydrologic connection is unimpeded by any physical barriers between the properties.

In 2012, the California Rapid Assessment Method (CRAM) was conducted on the Yang property. Three vernal pool system Assessment Areas (AAs) were evaluated. All three received relatively high overall CRAM scores (averaging 81 out of 100). Among the four attributes evaluated under CRAM, all three AAs received relatively high scores for the Buffer and Landscape Context and Hydrology attributes. Lower scores for Physical Structure and Biotic Structure attributes resulted from a general lack of structural patch richness, topographic complexity, and endemic vernal pool plant species. The lower scores also reflected the presence of a high percentage of non-native plant species in the pools.

On February 12, 2013, RC biologists visited the site with Zach Simmons (USACE) and Clifford Meek (EPA). Based on this visit, wetland mapping was revised resulting in a decrease in vernal pool acreage compared to the original assessment. In addition, during the site visit the USACE indicated that the threat of land conversion in the area is sufficient to justify USACE accepting the preservation of the existing features as part of the mitigation palette.

C5.2.2 Environmental Stressors

No evidence of previous farming or grazing was apparent during the site visits. However, the presence of orchards within 500 meters of the AAs assessed for CRAM was identified as a stressor. Other environmental stressors that may affect wetlands on the Yang property include the adjacent roadways (Road 80, Avenue 8), invasive non-native vegetation, illegal garbage disposal on adjacent parcels, and encroachment on the adjacent and surrounding parcels as natural lands are converted to agricultural uses.

C5.3 Wildlife Assessment

C5.3.1 Reconnaissance Surveys

The primary vegetation communities observed on the Yang property were alkali desert scrub and annual grassland, which support vernal pool complexes and vernal swales. These parcels lie within the San Joaquin Kit Fox Southwestern Tulare County Satellite Area and the Deer Creek–Sand Ridge and Highway 43–Garces Highway missing linkages. The natural vegetation communities observed on the property provide relatively undisturbed, high-quality habitat suitable for vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity, and have either been reported or have the potential to be present on the properties.

C5.3.2 Desktop Review

Vernal pool fairy shrimp have been confirmed to be present at the Allensworth Ecological Reserve. The next-closest reported observation of this species is in the Pixley National Wildlife Refuge, which is approximately 7 miles to the north. Unidentified fairy shrimp were observed in various vernal pool complexes within the Yang property in 2010, and given the hydrologic connectivity of the property to the Allensworth Ecological Reserve, it is reasonable to infer that vernal pool fairy shrimp could be present onsite.

Blunt-nosed leopard lizards were reported onsite and immediately to the east at the Allensworth Ecological Reserve in 2005. The alkali desert scrub and annual grasslands on the properties provide suitable habitat for the species, and no impediments to movement are present between the Yang property and the Allensworth Ecological Reserve.

The closest reported Swainson's hawk observations are approximately 7.6 miles to the northwest of the Yang property (in 2000) and approximately 10.5 miles to the west (in 1994). Although no mature trees are present on the properties, the surrounding alkali desert scrub, annual grasslands, and agricultural lands provide suitable foraging habitat for the species. CDFW presumes that Swainson's hawks are present in the Allensworth Ecological Reserve and could be encouraged to nest and forage onsite by planting nest trees.

Multiple western burrowing owl observations were reported on the properties and at the Allensworth Ecological Reserve in 2004 and 2005, and burrowing owls were observed during the 2010 reconnaissance surveys.

The closest reported Nelson's antelope squirrel observations are approximately 1 and 1.6 miles to the southwest (in 1988), and CDFW presumes that the species is present at the Allensworth Ecological Reserve. The alkali desert scrub and annual grasslands on the property provide suitable habitat for this species.

Tipton kangaroo rats were last reported on the properties, immediately to the east in the Allensworth Ecological Reserve, and on the surrounding properties to the west and south in 1985. The alkali desert scrub and annual grasslands on the properties provide suitable habitat for this species, and small-mammal tracks and tail drags were observed onsite, suggesting occupancy by kangaroo rats.

San Joaquin kit foxes were last reported on the properties and at the Allensworth Ecological Reserve in 1988; additional observations were reported in the region in 1975 and 2004. The alkali desert scrub and annual grasslands on the properties provide suitable denning and foraging habitat for the species. Suitably sized burrows that could provide denning habitat for this species were observed on the properties. Also, the signs of small-mammal (e.g., *Dipodomys* sp.) occupancy that were observed onsite, including tail drags and small-mammal burrows, are evidence of the availability of the prey base necessary to support and sustain resident kit foxes.

Special-status and other common species observed on the Yang property between 2010 and the present include unidentified fairy shrimp, spadefoot toad tadpoles and adults, coast horned lizard (*Phrynosoma blainvillii*), California whiptail (*Aspidoscelis tigris munda*), unidentified kangaroo rat (*Dipodomys* sp.) signs, and fresh American badger (*Taxidea taxus*) burrowing activity. In the adjacent Allensworth Ecological Reserve, CDFW has confirmed or presumed the presence of the following additional special-status species: San Joaquin whipsnake (*Masticophis flagellum ruddocki*; presumed), golden eagle (*Aquila chrysaetos*), loggerhead shrike (*Lanius ludovicianus*), and San Joaquin pocket mouse (*Perognathus inornatus*).

C5.3.3 Botanical Reconnaissance Surveys

During spring 2010 field surveys of the Yang property, several sensitive natural communities were identified onsite, including alkali goldenbush scrub (Not Ranked), alkali goldfields vernal pools (Not Ranked), bush seepweed scrub (S3.2), iodine bush scrub (S3), saltgrass flats (S4), and spinescale scrub (S3). The majority of the site is a mosaic between these six communities with alkali goldfields vernal pools, spinescale, and saltgrass flats being the dominants.

Four special-status plant species were identified onsite. These include little mouse-tail (*Myosurus minimus* ssp. *apus*) (CNPS 3.1), recurved larkspur (*Delphinium recurvatum*) (CNPS 1B.2), heartscale (*Atriplex cordulata*) (CNPS 1B.2), and lesser saltscale (*Atriplex minuscula*) (CNPS 1B.1). Hundreds to thousands of individuals of each of these four species were observed within the surveyed area, and they are expected to occur in similar densities within appropriate habitat throughout the Yang property. Recurved larkspur, heartscale, and saltscale were common within alkali goldenbush scrub, alkali goldfields vernal pools, bush seepweed scrub, iodine bush scrub, saltgrass glats, and spinescale scrub. Little mousetail was abundant, occurring in the thousands, in alkali goldfields vernal pools.

Several other CNPS and State Endangered plant species were not seen during surveys, but could be present based on their range and habitat requirements. These include Bakersfield smallscale (*Atriplex tularensis*) (State Endangered, CNPS 1B.1), brittlescale (*Atriplex depressa*) (CNPS 1B.2), Earlimart orache (*Atriplex erecticaulis*) (CNPS 1B.2), vernal pool saltscale (*Atriplex persistens*),

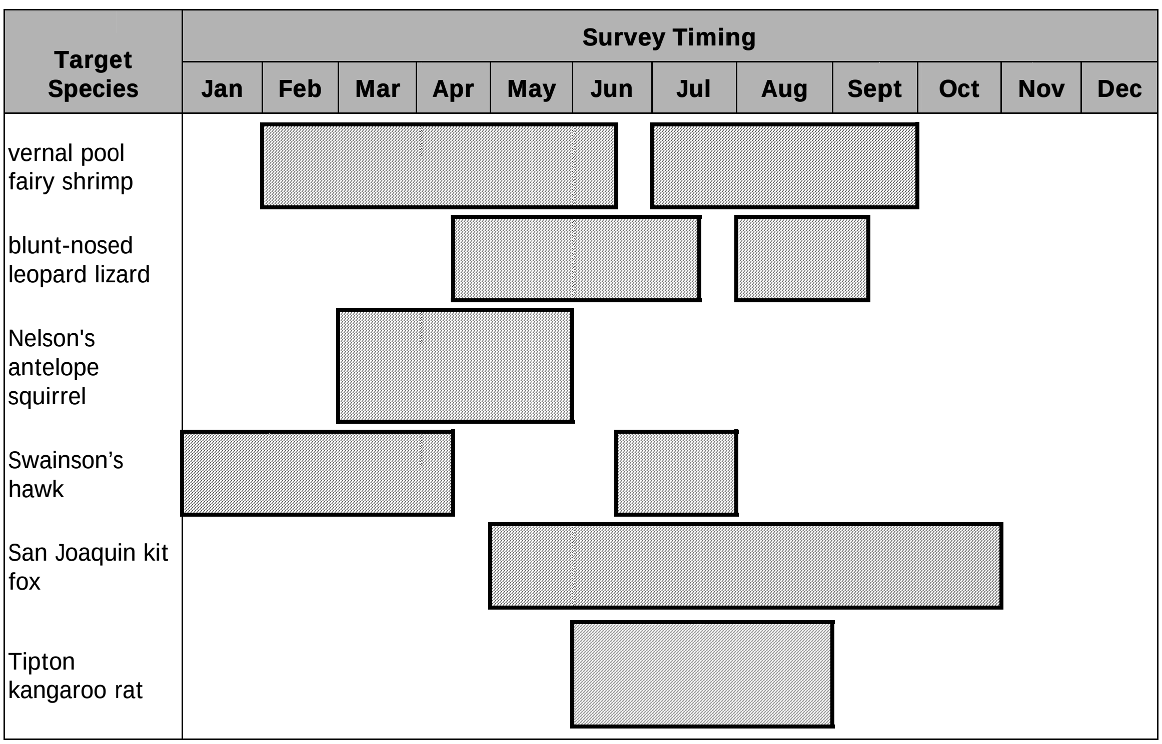
subtle orache (*Atriplex subtilis*) (CNPS 1B.2), Lost Hills crownscale (*Atriplex vallicola*) (CNPS 1B.2), and button-celery (*Eryngium spinosepalum*) (CNPS 1B.2). Several populations of crownscale (*Atriplex coronata* var. *coronata*) (CNPS 4.2) were identified on nearby and adjacent properties and individuals of this species likely occur onsite.

At the Allensworth Ecological Reserve, CDFW has confirmed the presence of the following special-status plant species: Kern mallow (*Eremalche kernensis*) (CNPS 1b.1; federal endangered), heartscale, brittlescale, Earlimart orache, alkali mariposa lily (*Calochortus striatus*) (CNPS 1b.2), and recurved larkspur.

C5.3.4 Focused Wildlife Surveys

RC biologists met with CDFW representatives on June 6, 2012, to discuss the potential mitigation sites and agencies' determination of current species presence. For the Yang property, the CDFW requested surveys for Nelson's antelope squirrel. CDFW inferred presence for the blunt-nosed leopard lizard, Swainson's hawk, burrowing owl, Tipton kangaroo rat, and San Joaquin kit fox.

In August 2012 and the spring of 2013, RC biologists conducted focused surveys to determine the presence of special-status wildlife species at the Yang property. The first round of surveys was conducted between August 7 and 21, 2012. RC biologists returned to the Yang property for additional focused surveys between April 15 and 19, 2013. Both surveys included use of camera trapping stations and pedestrian surveys to identify other special-status wildlife species and were timed to coincide with the survey windows (see table below) for blunt-nosed leopard lizard, San Joaquin kit fox, and Tipton kangaroo rat. Small-mammal trapping occurred only during the 2012 surveys.



During the surveys, RC biologists used the following criteria from the previous reconnaissance survey to identify appropriate target survey areas within these properties:

- Presence of small-mammal burrow complexes.
- Presence of kangaroo rat sign (e.g., burrows in sandy soil, dust bath areas, tail drags).

- Proximity to known populations of special-status species.
- Habitat integrity.

Methods

Dry-Season Sampling

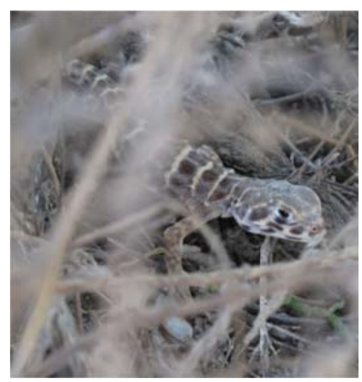
On September 19, 2012, an RC biologist with a USFWS Section 10(a)(1)(A) Recovery Permit for federally listed branchiopods conducted dry-season soil sampling. Additional staff worked with the permitted individual in accordance with the recovery permit. Branchiopod cyst sampling consisted of identifying the vernal pools believed to be the most likely to support vernal pool brachiopods and collecting soil samples along transects within the pool. The samples were collected into clean, airtight containers for transport to a laboratory for future identification. Biologists took relevant data and representative GPS points for each soil sample.

The dry-season soil samples collected previously are currently being processed in the laboratory. The process involves using water and soil sieves to isolate the branchiopod (fairy and tadpole shrimp) cysts (resting eggs) from the soil matrix. Cysts are sent to a genetics laboratory at California State University, Los Angeles, where viable embryos will be extracted from the cysts, DNA will be extracted from the embryos, and a genetic analysis will be conducted to make a more definitive species identification than can be determined morphologically.

Small-Mammal Trapping

August 2012: Live-trapping was conducted according to Tipton kangaroo rat survey protocols as described in CDFW's "Region 4 approved survey methodologies for sensitive species" (CDFG 1990), as well as protocols outlined in the USFWS Section 10(a)(1)(A) Recovery Permit for federally listed small-mammal species of the Central Valley. All surveys were conducted under the supervision of ESRP biologists Brian Cypher and Christine Van Horn Job under a USFWS Section 10(a)(1)(A) Recovery Permit for the federally listed Tipton kangaroo rat.

Modified Sherman aluminum box traps were deployed at approximately 15-meter intervals along four transects. Biologists set two transects with 30 traps and two transects with 15 traps for a total of 90 traps (Figure 3). Traps were provisioned with millet seed (bait) and a paper towel (bedding). Traps were set out at dusk on August 7, 2012, and checked and checked the next morning before sunrise on August 8, 9, and 10, for a total of 270 trap nights. A detailed description of small-mammal trapping methods is provided in the ESRP memorandum (Appendix D).



No small-mammal trapping was conducted during the 2013 surveys.

Camera Trapping

August 2012: Heat and motion-triggered digital camera traps were installed, corresponding with active burrows, game trails, or other sign to detect blunt-nosed leopard lizards, burrowing owls, Nelson's antelope squirrel, Tipton kangaroo rats, and San Joaquin kit fox (Figure 3). The station was baited with cat food and oats. Two camera stations (labeled 2 and 3) were set on August 7 and 8, 2012, and removed on August 21, 2012. All photos were inspected visually and digitally catalogued in a database.

Spring 2013: RC biologists established two camera traps (CS6 and CS7) on the Yang property (Figure 3). Both were set up from April 17 to May 1. Both stations were baited with cat food and an peanut butter / oat mix.

Pedestrian Surveys

August 2012: RC biologists conducted pedestrian surveys for evidence or direct observation of blunt-nosed leopard lizards, Swainson's hawks, Tipton kangaroo rats, and San Joaquin kit foxes. Although surveys were not performed in strict accordance with agency-approved protocols, three of the biologists (Jolie Hendricks, Melissa Newman, and Sue Townsend) are qualified Level 1 blunt-nosed leopard lizard surveyors.

Biologists walked random transects and noted all vertebrate species observed. All sign (burrows, tracks, bones, scat) that may indicate presence of listed species was photographed and/or recorded with a GPS point.

Biologists conducted nighttime spotlighting along the western and southern sides of the property on August 11, 2012. Spotlight surveys began approximately 1 hour after sunset. Biologists slowly drove the roads while using high-powered spotlights to scan habitat. The light illuminates the movement and shape of animals and their eyeshine, making them very visible. To the extent possible, all eye shine detected during spotlighting surveys was identified to species. The spotlight route was clearly marked on a map and species data were recorded.

Spring 2013: Pedestrian surveys were conducted on April 17. RC biologists surveyed the site in the late afternoon and returned after sunset for nighttime driving surveys. Short visits were also made on April 19. Two additional visits were made in May to retrieve traps and to escort agency representatives.

Results

Dry-Season Sampling

Seventeen bags of soil were collected from the Yang property. These samples were carefully labeled and stored in airtight containers, and processed to isolate cysts. A number of the samples from the Yang property have been processed, and these samples yielded abundant fairy shrimp cysts. They have been sent to the lab for genetic analysis.

Small-Mammal Trapping

Captures included five Heermann's kangaroo rats (*Dipodomys heermani*) and three San Joaquin pocket mice (*Perognathus inornatus*). No Tipton kangaroo rats were captured (Figure 3). A Tipton kangaroo rat was reported to have been captured on that unit within the past 10 years. Habitat on the Yang property appears highly suitable for Tipton kangaroo rat, and the potential for occupancy by Tipton kangaroo rat is high.

Camera Trapping

August 2012: The camera trapping effort totaled 23 trap nights and 1,873 images. Most of these were blank, but at least five species were positively identified. Camera trap photos depicted desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbits (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), coyotes (*Canis latrans*), and kangaroo rat (*Dipodomys* spp.). No kit fox or other target species were detected through photographs. Kangaroo rats were photographed but species identification requires physical inspection of the hind leg and is not possible with camera trap photos.

Spring 2013: The camera trapping totaled 26 trap nights and 1,604 images. No target species were positively identified, but the photos depicted kangaroo rats, common ravens, jackrabbits, unidentified small mammals, and a horned lark. Camera traps on the adjacent Staffel property captured an image of an American badger.

Pedestrian Surveys

August 2012: During meandering transect surveys; biologists noted multiple animal species onsite. Biologists did not observe Swainson's hawks, Nelson's antelope squirrels, or San Joaquin kit fox. However, two blunt-nosed leopard lizards were detected. The first observation occurred on August 7, 2012, on the road traveling into the site on the Yang property at 10:30am. The second observation was made on August 8, 2012, on the Yang property at 9:10am (right, Figure 3). Both individuals were juveniles. Spotlighting surveys revealed coyotes, desert cottontails, and burrowing owls on the Yang property.

Spring 2103: During site visits in April and May, RC biologists observed burrowing owl chicks and their parents, an adult blunt-nosed leopard lizard, an adult coast horned lizard, and a large San Joaquin coachwhip (*Masticophis flagellum ruddocki*). During nighttime spotlight surveys, biologists noted 11 jackrabbits, two cottontails, two burrowing owls, and two coyotes. An additional, unidentified canid was encountered, but the biologists were unable to get a positive identification.

The presence of blunt-nosed lizards and numerous species of special concern, including coast horned lizards, San Joaquin coachwhip, burrowing owls, and American badgers, indicate that the Yang property is extremely valuable to wildlife. A list of wildlife species observed on or near the Yang property is provided in the table below.

Class	Common Name	Scientific Name
amphibians	boreal toad	*Anaxyrus boreas boreas*
reptiles	blunt-nosed leopard lizard	*Gambelia sila*
	common side-blotched lizard	*Uta stansburiana*
	coast horned lizard	*Phrynosoma coronatum*
	tiger whiptail	*Aspidocelis tigris*
	San Joaquin coachwhip	*Masticophis flagellum ruddocki*
birds	American white pelican	*Pelecanus erythrorhynchos*
	great egret	*Ardea alba*
	turkey vulture	*Cathartes aura*
	northern harrier	*Circus cyaneus*
	red-tailed hawk	*Buteo jamaicensis*
	American kestrel	*Falco sparverius*
	killdeer	*Charadrius vociferus*
	mourning dove	*Zenaida macroura*
birds (cont'd.)	barn owl	*Tyto alba*
	burrowing owl	*Athene cunicularia*
	loggerhead shrike	*Lanius ludovicianus*
	common raven	*Corvus corax*
	horned lark	*Eremophila alpestris*

Class	Common Name	Scientific Name
	European starling	*Sturnus vulgaris*
	western meadowlark	*Sturnella neglecta*
	house finch	*Carpodacus mexicanus*
mammals	California ground squirrel	*Otospermophilus beecheyi*
	deer mouse	*Peromyscus maniculatus*
	Heerman's kangaroo rat	*Dipodomys heermanni*
	San Joaquin pocket mouse	*Perognathus inornatus inornatus*
	desert cottontail	*Sylvilagus audubonii*
	black-tailed jackrabbit	*Lepus californicus*
	American badger	*Taxidea taxus*
	coyote	*Canis latrans*
	bobcat	*Lynx rufus*

Summary

A summary of species presence, either confirmed or presumed, on the Yang property is provided here.

- Vernal pool fairy shrimp have been confirmed to be present at the Allensworth Ecological Reserve, which is hydrologically connected to the Yang property. During the 2010 surveys, RC biologists observed unidentified fairy shrimp in vernal pools complexes within the Yang property. The survey results and agency coordination appear to indicate that vernal pool fairy shrimp are likely present on the Yang property. The dry-season samples have been processed, yielding cysts, but species confirmation is pending lab results.

- Blunt-nosed leopard lizard: Three blunt-nosed leopard lizards were seen at the Yang property. Habitat conditions are optimal for this species. Both of the lizards were juveniles, confirming a breeding population of the species occurs onsite.

- Swainson's hawks: No Swainson's hawks were observed. Red-tailed hawk observations indicate the property may support Swainson's hawk. Abundant small-mammal activity provides a good prey base for hawks.

- Burrowing owl: Numerous owls and extensive burrows were observed during the surveys. The young burrowing owls observed in 2013 confirm that this species is breeding onsite. California ground squirrels are relatively common onsite, providing burrow complexes for the owls.

- Nelson's antelope squirrel: This species is most active during the spring. Surveys did not detect antelope squirrels but the habitat – open, with sparse vegetation – is highly suitable for the species (Brian Cypher personal communication, September 20, 2012). Focused surveys could be conducted for Nelson's antelope squirrel to determine current presence. If this species is not present, then the site would be an excellent reintroduction site.

- Tipton kangaroo rat: No Tipton kangaroo rats were captured onsite. The habitat is optimal for the species and it is presumed present. Brian Cypher (personal communication, September 20, 2012) confirms that the potential for Tipton kangaroo rat occupancy is high. Lack of trap captures may be due to high temperatures and decreased activity periods, or transects may have not intersected Tipton kangaroo rat microhabitats.

- San Joaquin kit fox: Brian Cypher (personal communication, September 20, 2012) notes that Yang provides highly suitable habitat and is contiguous with suitable habitat in the region and therefore, there is a high potential for kit foxes onsite. The condition of the habitat on the Yang property is excellent and exhibits little sign of any anthropogenic modification. The site is characterized by low to moderate densities of shrubs, and a low, open herbaceous ground cover. Such conditions are optimal for use by San Joaquin kit fox. Furthermore, the sites are in an area where habitat is being protected in an effort to provide connectivity for San Joaquin kit fox between Allensworth Ecological Reserve and associated lands to the north, and conserved lands to the southwest in and around the North Semitropic Ecological Reserve and the Kern National Wildlife Refuge.

C5.4 Next Steps

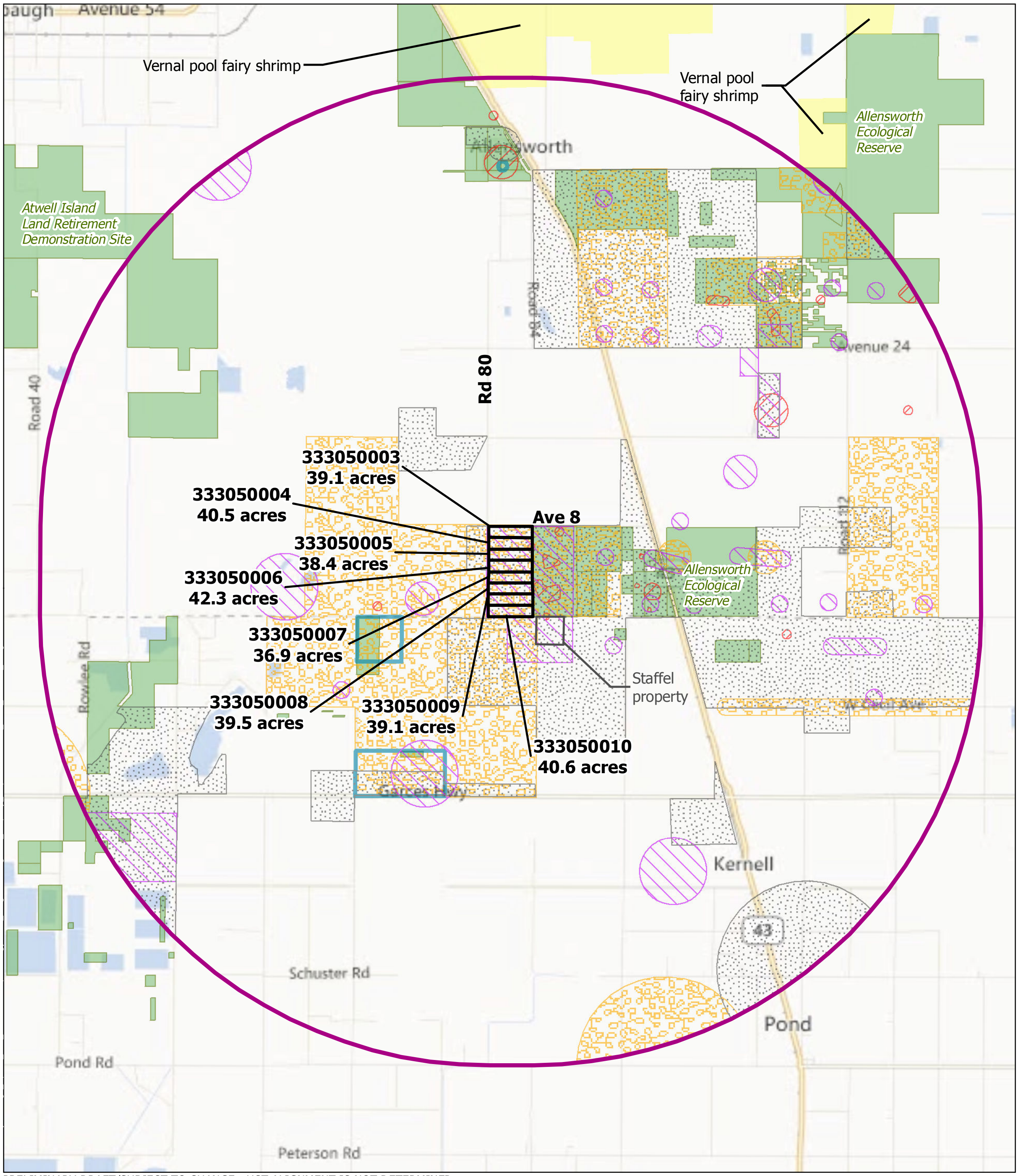
Aquatic and upland habitats on the property provide suitable opportunities for enhancement (garbage removal and vegetation management) and preservation. Hydrological modifications on the property may establish or enhance connectivity with the adjacent Allensworth Ecological Reserve. If warranted, Swainson's hawks could be encouraged to nest and forage onsite through tree plantings. Habitat quality on this site appears to be excellent (Brian Cypher, personal communication, September 20, 2012). Other than occasional trash along edges of the property, there is little sign of disturbance. Also, the property adjoins a unit of the Allensworth Ecological Reserve, which is owned and managed by the CDFW. Conservation of this site would protect an extensive vernal pool complex, numerous wildlife species and plants, and add to the conservation of connected, protected lands.

Future coordination with agency personnel will be critical to developing a conservation easement on the property and to helping identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Yang Property (316.4 acres)	
Resource Type	**Acreage Available**
Wetlands	
Vernal pool	97.7 ac
Seasonal wetland	N/A
Riverine	N/A
Wildlife	
vernal pool fairy shrimp	97.7 ac
vernal pool tadpole shrimp	97.7 ac
blunt-nosed leopard lizard	316.4 ac
Swainson's hawk	316.4 ac
western burrowing owl	316.4 ac
Nelson's antelope squirrel	316.4 ac

Yang Property (316.4 acres)	
Resource Type	**Acreage Available**
Tipton kangaroo rat	316.4 ac
San Joaquin kit fox	316.4 ac
ac = acres N/A = not applicable	

Yang property, showing vernal pool features (left) and animal runs (right).



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: Bing Imagery maps, CNDDB 2012

October 15, 2012

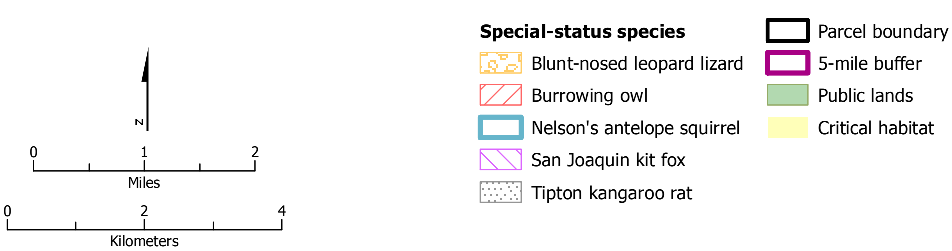
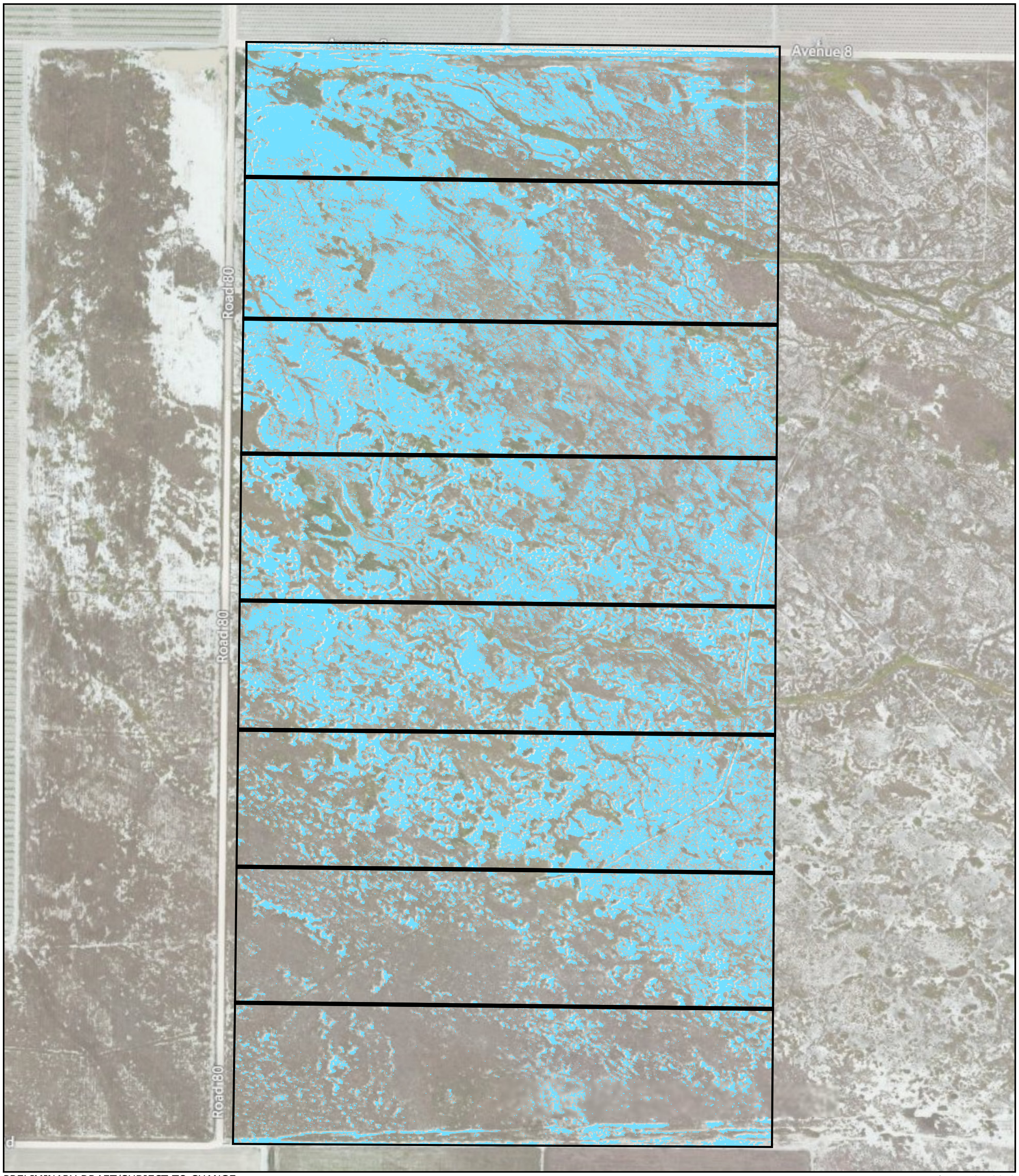


Figure 1
CNDDB occurences and critical habitat
Yang properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: NAIP, 2010; URS, 2013

February 25, 2013

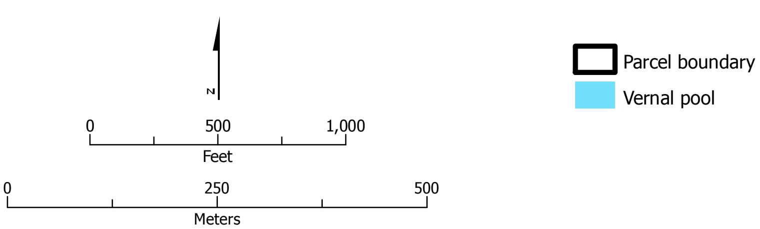
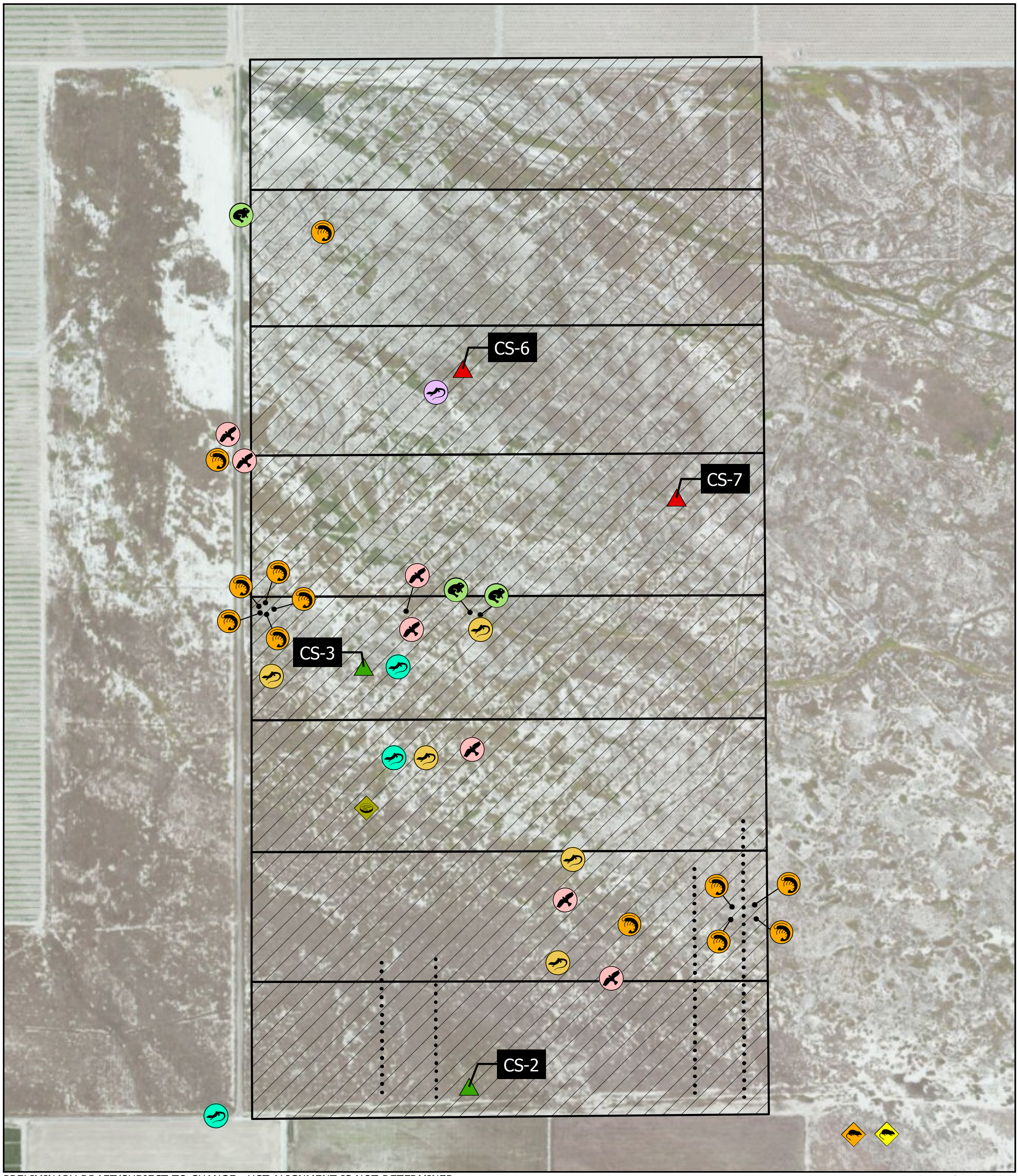


Figure 2
Wetland survey map
Yang properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Data source: URS, 2012

September 24, 2013

Figure 3
Special-status species survey results
Yang properties

C6.0 Fagundes Property

The Fagundes properties were first identified through stakeholder outreach. In July 2012, landowner Johnnie Fagundes Sr. of Fagundes Agribusiness contacted the Authority to propose the Fagundes properties, formerly under investigation as a potential mitigation bank in 2000, as candidate mitigation properties. In August, Johnnie Fagundes responded to a Permission-to-Enter mailing granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable mitigation resources onsite. The initial reconnaissance-level survey was performed in August 2012, and in September 2012 a draft conceptual analysis of wetland restoration and establishment potential was performed. In October 2012, title reports were requested for the APNs under investigation. A follow-up reconnaissance-level survey was performed in November 2012. The Authority and its consultants have continued to work with Johnnie Fagundes through coordination of the conceptual wetland design onsite.

The proposed Fagundes mitigation property consists of two parcels in Kings County, Parcel A (250 acres) and Parcel B (155 acres), that lie to the west of Highway 99, approximately 12 miles northwest of Visalia (Figure 1). These two parcels support grassland habitat with scattered vernal pool complexes. The two individual Fagundes parcels are connected by a narrow strip of land that parallels Cross Creek. This strip of land and the adjoining grasslands south of Cross Creek are privately owned, but the Fagundes family grazes these parcels (together with the Fagundes parcels) under a lease with the landowner. Cross Creek defines the southern boundary of Parcel A and the eastern boundary of Parcel B. The creek conveys stormwater runoff from lands to the east in the winter and irrigation tail water during the spring and summer.

These two parcels compose the southwestern end of a corridor of open space that is bisected by Highway 99 and surrounded by agricultural lands, primarily row crops. This corridor follows Cross Creek and is mapped as critical habitat for the federally listed vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), and California tiger salamander (*Ambystoma californiense*) (Figure 1). Conservation of the Fagundes property would contribute approximately 405 acres of habitat to the 1,350 acres of contiguous open space that follows Cross Creek west of Highway 99.

Four vegetation communities are found on the two parcels: alkali grassland (375 acres), northern claypan vernal pools and swales (10.01 acres), riparian habitat (7.4 acres), and seasonal wetland drainages (2.7 acres). The entire 405-acre Fagundes property is suitable for mitigation. The alkali grassland habitat primarily consists of non-native annual grasses typical of the region. The seasonal wetland drainages occur in areas that may have once been former channels of Cross Creek.

These acres include opportunities for vernal pool restoration, enhancement, establishment, and preservation. Because vernal pools are already present on the Fagundes property and soils are mapped as conducive for vernal pool formation, conditions are favorable for successful vernal pool establishment. The reaches of Cross Creek and its tributaries that run through the property provide opportunities for riparian rehabilitation and riverine preservation. The riparian habitat onsite is discontinuous along Cross Creek. This discontinuity may be attributed, in part, to cattle grazing, which limits recruitment of riparian vegetation. Restricting cattle grazing to certain seasons or areas, or establishing a less intensive grazing management regime, could contribute to riverine and riparian restoration.

C6.1 Wetland Resources

C6.1.1 Reconnaissance Surveys

The Fagundes properties are within the Upper Kaweah watershed. In 2000, Johnnie Fagundes commissioned a review of biological resources at the Fagundes properties. A wetland delineation of both parcels revealed 10.01 acres of vernal pools, 2.42 acres of wetland drainages (seasonal wetlands) and 7.4 acres of jurisdictional waters within the bed and bank of Cross Creek (Live Oak Associates 2001).

The vernal pools on the Fagundes property are topographic depressions characterized by a hardpan soil layer that fill with rainwater or overflow from Cross Creek. The vernal pools hold water during the rainy season, typically filling by December or January. During wet years, the water in the pools persists into late April or early May. Surveys identified 77 vernal pools on the property in 2000 (Live Oak Associates 2001). Typical plant species occurring in the pools include slender popcorn flower (*Plagiobothrys stipitatus*), dwarf wooly-heads (*Psilocarphus brevissimus* ssp. *brevissimus*), and swamp timothy (*Crypsis schoenoides*).

Based on the Live Oak Associates study, the site could support an additional 17.55 acres of vernal pools (Live Oak Associates 2001). However, for the current analysis, RC biologists hand-digitized, compared, and overlaid the existing and proposed vernal pool features identified in the Live Oak Associates, Inc., report (2001) on current aerial imagery of the Fagundes property and found that only 8.7 acres of vernal pool establishment are within the boundaries of parcels A and B. A study of precipitation on the property is sufficient to support the creation of vernal pools on the Fagundes property that would meet the USACE guidelines for ponding (i.e., at least 19 days a year in 5 of 10 years). Based on the presence of mapped soils, it is presumed that if depressions were created on the property to support the appropriate wetland hydrology, other vernal pool characteristics, including vegetation, and wildlife, would follow. (If desired, the period of inundation could be increased by enlarging the catchment basin of the constructed pools by designing a more gradually sloping pond edge that would drain precipitation into the center of the pond.) To mimic the density found in natural vernal pool complexes, ponds would be constructed with a minimum distance of 200 feet between them, limiting the pool density to 7% of the total area. Clustering the established pools rather than distributing them evenly across the property would maximize habitat construction and limit disturbance to upland habitats.

Cross Creek serves as the property boundary for both parcels. It is assumed that only half of the river and its associated riparian habitat on the Fagundes property side could be used as mitigation for the HST project. Under this assumption, the property has approximately 14.7 acres that could potentially be used for riverine habitat preservation or enhancement. This number of acres may be updated as a result of a more detailed wetland delineation of the site.

C6.1.2 Environmental Stressors

The stressors identified during the reconnaissance surveys include adjacent land uses. Agricultural runoff from surrounding agricultural land may alter the nutrient and chemical load in Cross Creek and groundwater. Historically, both parcels have been used for pastureland, which can compact soils and potentially hinder native plant establishment in vernal pool systems. Cattle impacts to Cross Creek, its tributaries, and associated riparian vegetation are fairly extensive. The cattle congregate near the creek, using it as a source for water and the few large trees for shade.

Wetland biologists will conduct a more detailed assessment of environmental stressors during a California Rapid Assessment Method (CRAM) survey. If mitigation planning moves forward, RC

biologists may conduct these standardized surveys during the spring season or as wetland conditions permit.

C6.2 Wildlife Assessment

C6.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on August 12, 2012, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Fagundes properties were annual grasslands, which support vernal pool complexes, vernal swales, and the riparian corridor associated with Cross Creek. These parcels are adjacent to other open space and the southwestern end of the St. John-Cross Creek linkage which provides connectivity east-west from the Sierra Nevada to the Great Central Valley via the Cross Creek riparian corridor. Another brief visit was made on May 21, 2013.

Biologists observed red-tailed hawk (*Buteo jamaicensis*) juveniles, mourning doves (*Zenaida macroura*), western burrowing owls (*Athene cunicularia*), northern mockingbirds (*Mimus polyglottos*), and California ground squirrels (*Otospermophilus beecheyi*) during the site visit. A list of all the birds seen onsite follows.

Common Name	Scientific Name
great egret	*Ardea alba*
red-tailed hawk	*Buteo jamaicensis*
mourning dove	*Zenaida macroura*
burrowing owl	*Athene cunicularia*
Say's phoebe	*Sayornis saya*
western kingbird	*Tyrannus verticalis*
cliff swallow	*Petrochelidon pyrrhonota*
northern mockingbird	*Mimus polyglottos*
Brewer's blackbird	*Euphagus cyanocephalus*
brown-headed cowbird	*Molothrus ater*
house sparrow	*Passer domesticus*

The aquatic features and vegetation communities present onsite provide habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamanders, Swainson’s hawk (*Buteo swainsoni*), western burrowing owl, and San Joaquin kit fox (*Vulpes macrotis mutica*). All of these species have been reported in the vicinity and have either been reported or have the potential to be present on the properties.

C6.2.2 Desktop Review

RC GIS specialists conducted a CNDDB query at a 5-mile radius of the properties for the species requiring mitigation (Figure 1).

The CNDDB query did not reveal any reports of vernal pool branchiopods. However, surveys conducted in 1999 documented the vernal pool fairy shrimp in eight of the sampled pools and tadpole shrimp in nine of the sampled pools (Live Oak Associates 2001).

There are no CNDDB records of California tiger salamanders within the 5-mile radius but the vernal pools and associated upland habitats with rodent burrows provide suitable upland habitat for the species. Amphibian eggs similar to California tiger salamander eggs have been observed in vernal pools (Live Oak Associates 2001) but presence of this species has not been confirmed and the property is outside of the reported range for this species.

While there were no CNDDB records for Swainson's hawks, RC biologists have observed these raptors breeding and foraging along Highway 99, just over a mile to the east of the Fagundes properties. There were three active nests during the 2012 breeding season along Highway 99 and the Cross Creek corridor. The larger trees and the adjacent open areas, including the Fagundes properties, likely provide suitable breeding and foraging habitats.

Burrowing owls were observed during the 2012 reconnaissance surveys and have been documented onsite numerous times. There is a CNDDB record from the Fagundes properties and records from previous surveys (Live Oak Associates 2001).

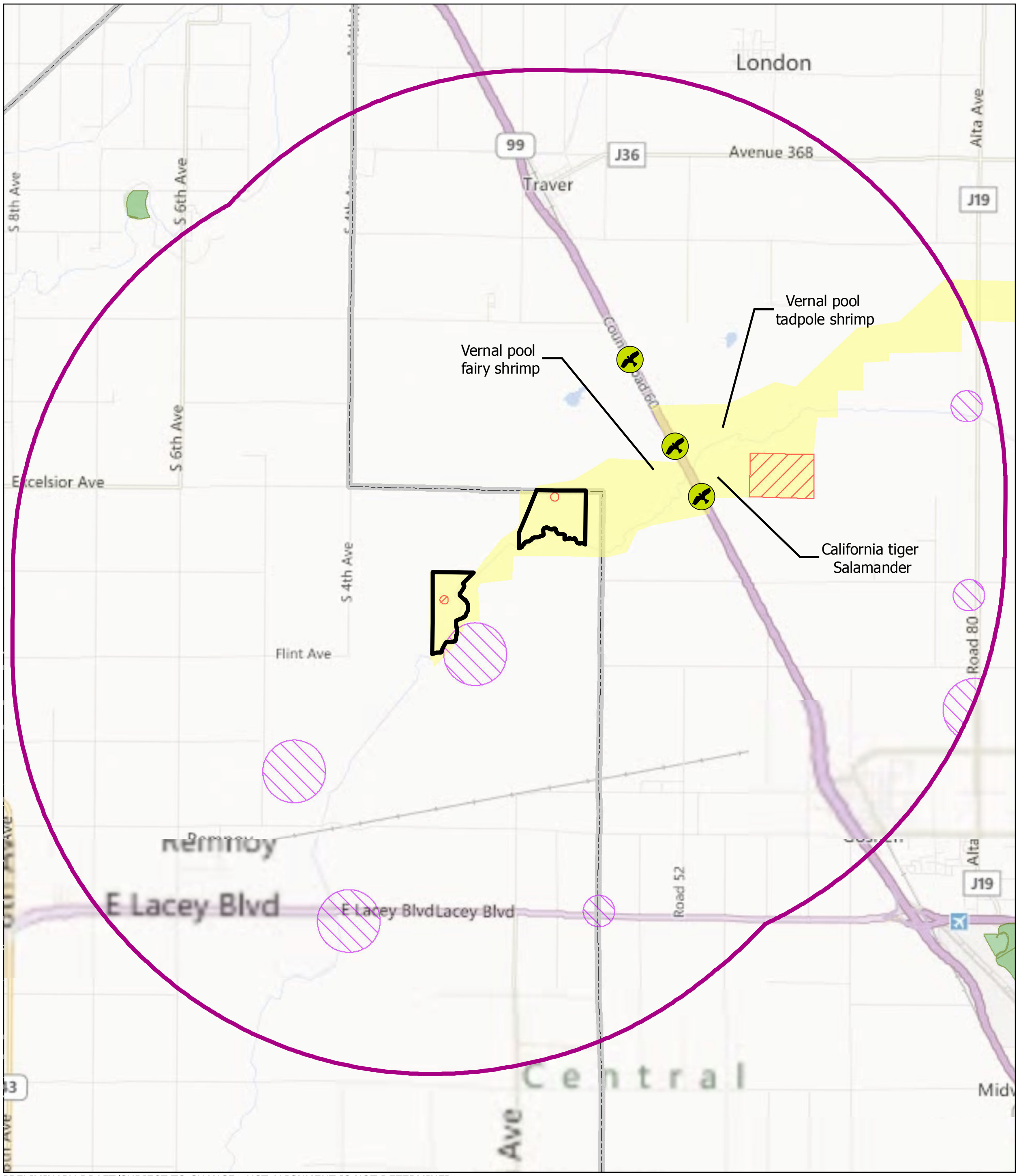
There are seven CNDDB reports of San Joaquin kit foxes within a 5-mile radius of the Fagundes site. San Joaquin kit foxes were last reported on the properties in 1975; however, a more recent observation was reported 4.5 miles east of the property (in 2003). The annual grasslands on the properties provide suitable dispersal, denning, and foraging habitat for the species.

C6.3 Next Steps

Johnnie Fagundes currently has consultants revising a portion of the wetland delineation for a proposed irrigation project, as the most recent reports are now over a decade old. Depending on what the current survey includes, LIDAR data or topographic survey data of the Fagundes property may be useful for restoration planning and design. A CRAM analysis of the aquatic features on the property is necessary to assess the current condition of the wetland complexes and identify where and how restoration, enhancement, or creation could increase habitat quality. Once these baseline data are collected, restoration ecologists could develop more detailed designs for creating vernal pools and restoring riparian areas.

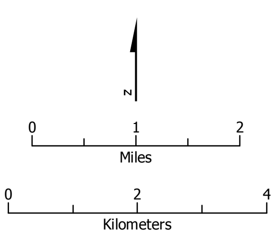
More recent and focused wildlife surveys for special-status species are also advised. These may include nighttime spotlighting, transect surveys, or camera trapping for San Joaquin kit fox, wet-season surveys for vernal pool branchiopods, and surveys for nesting Swainson's hawks.

Fagundes Properties (405 acres)	
Resource Type	**Acreage Available**
Uplands	
Riparian	5.6 ac rehabilitation/enhancement
Wetlands	
Vernal pool	7.6 ac preservation
	8.7 ac establishment
Seasonal wetland	2.7 ac preservation
Riverine	14.7 ac rehabilitation/enhancement
Wildlife	
vernal pool fairy shrimp	10.3 ac preservation
	8.7 ac creation
vernal pool tadpole shrimp	10.3 ac preservation
	8.7 ac creation
California tiger salamander	365.7 ac upland
	10.3 ac aquatic preservation
	8.7 ac aquatic establishment
Swainson's hawk	405 ac
western burrowing owl	384.7 ac
San Joaquin kit fox	384.7 ac
ac = acres N/A = not applicable	



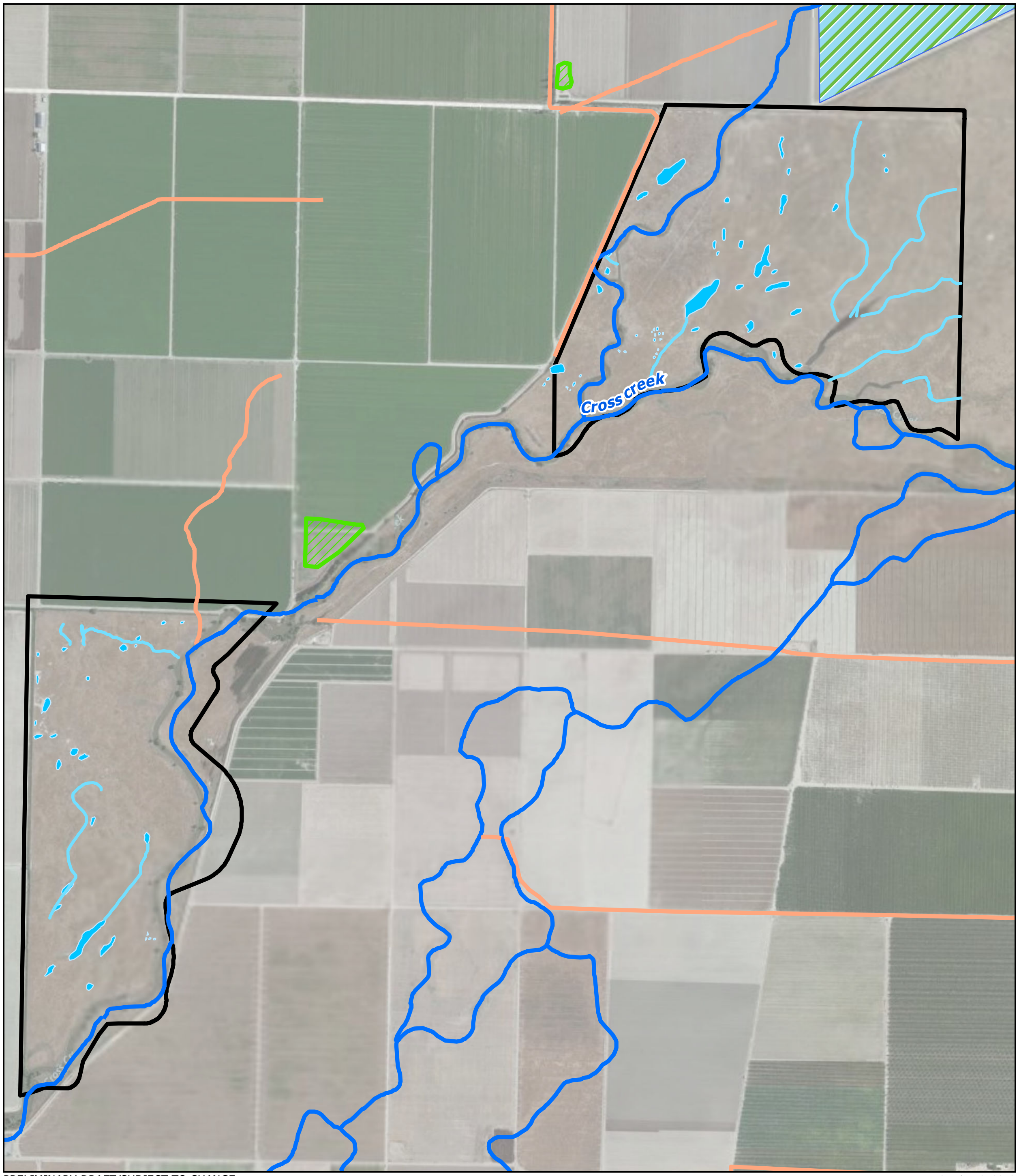
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: Bing Imagery maps, CNDDB 2012, Swainson's hawk nests, URS 2012.

December 6, 2012



Special-status species
- Burrowing owl
- San Joaquin kit fox
- Swainson's hawk nest
- Parcel boundary
- 5-mile buffer
- Public lands
- Critical habitat

Figure 1
CNDDB occurences and critical habitat
Fagundes properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE

October 8, 2012

Source: Existing wetlands prepared by Haistead & Associates, 2000 as cited in Live Oak associates 2001; digitized by URS, 2012; aerial imagery of Kings County, 2010, NWI data is from Fish and Wildlife Service 2012 & NHD data is from USGS.

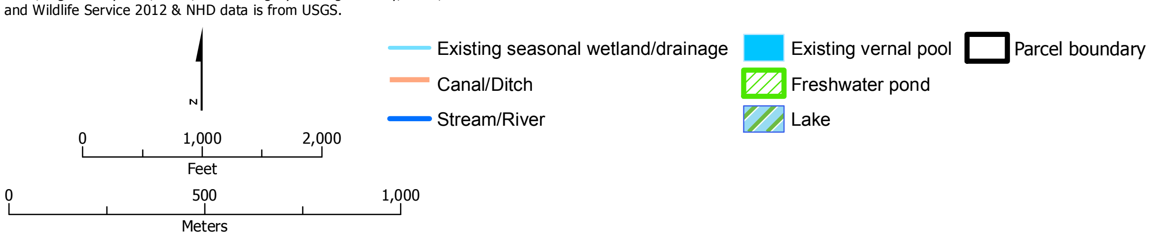
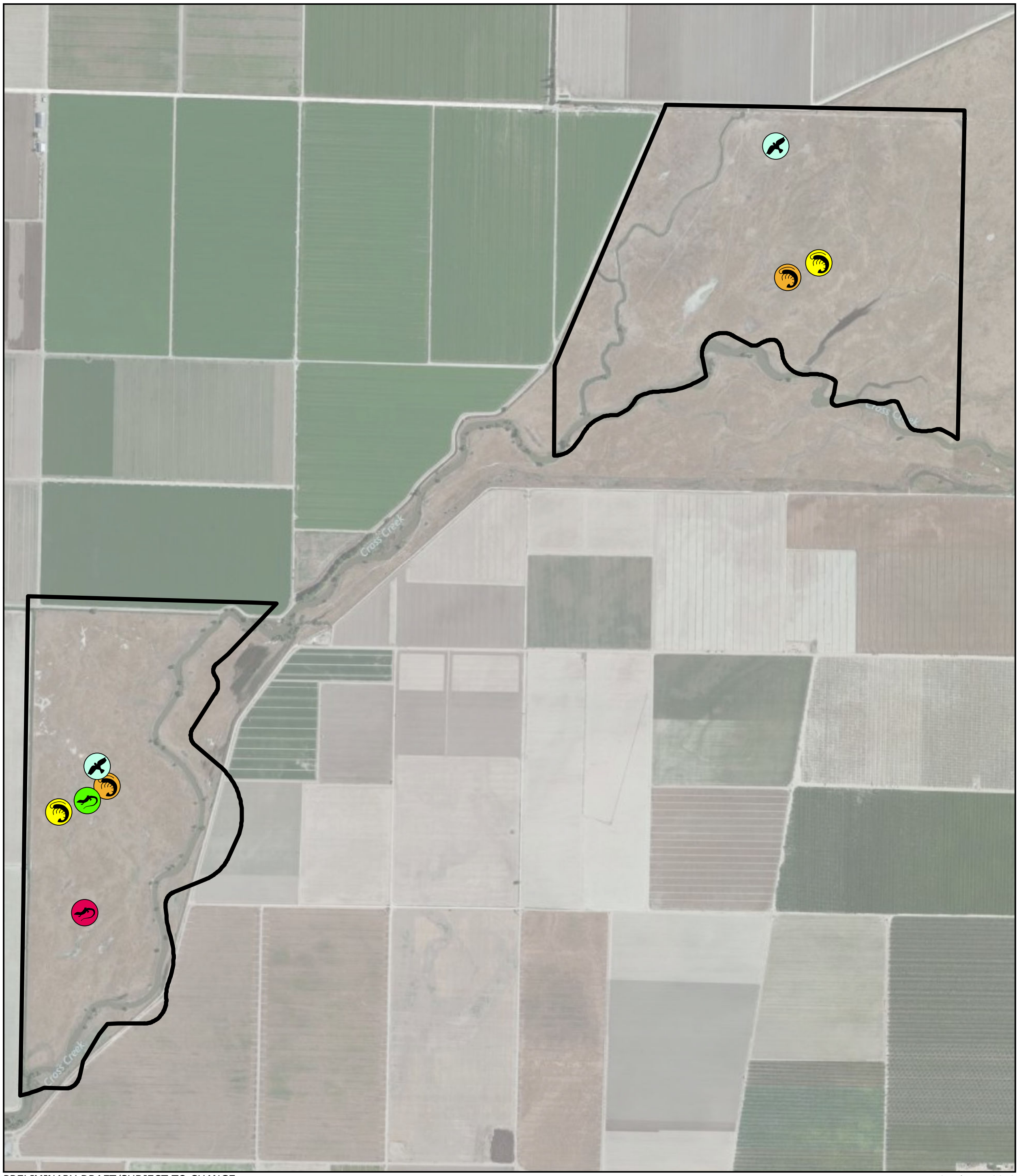


Figure 2
Wetland survey map
Fagundes properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

October 4, 2012

N

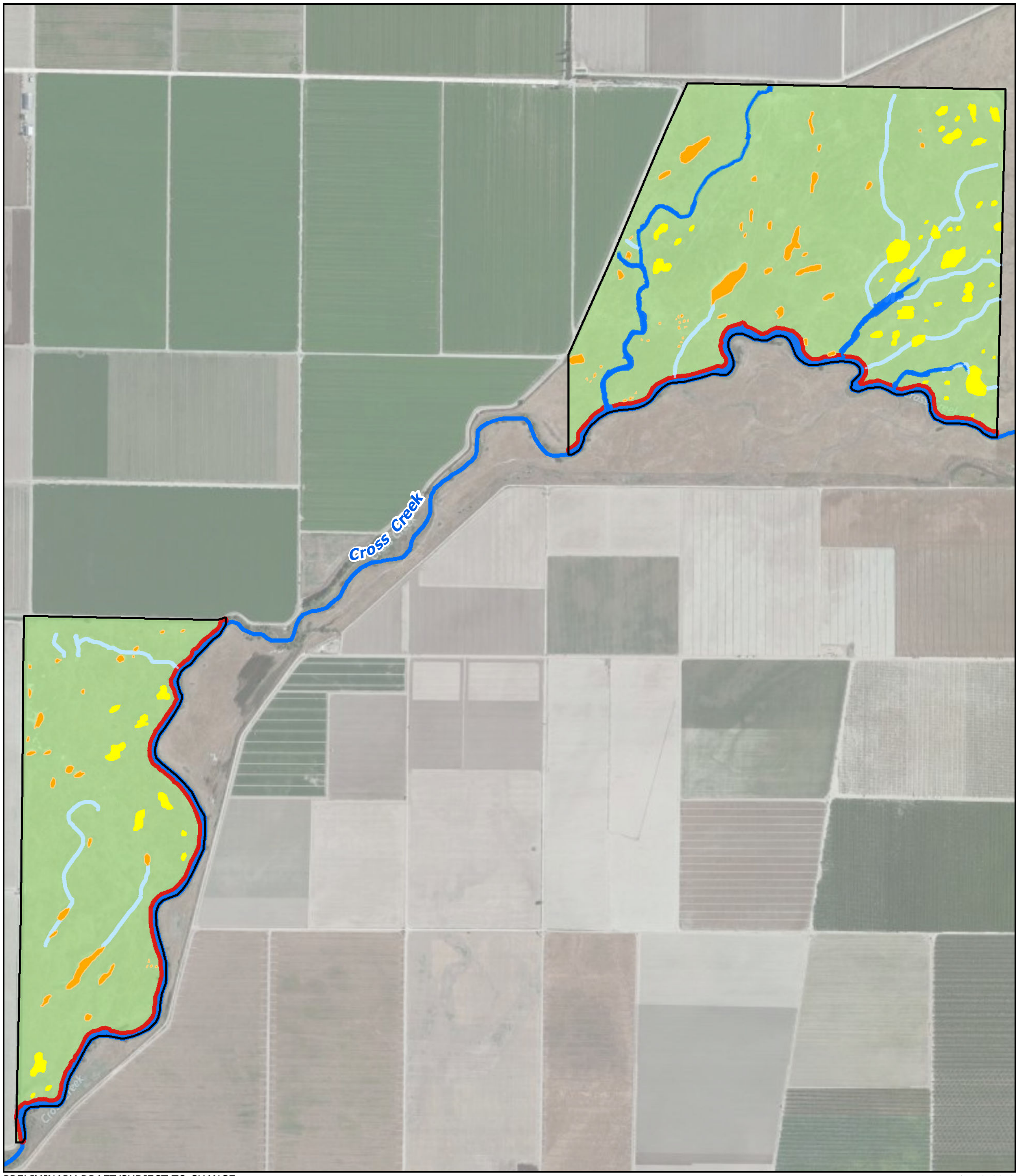
0 1,000 2,000
Feet

0 500 1,000
Meters

CNDDB species records

- California tiger salamander
- Western spadefoot
- Burrowing owl
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Parcel boundary

Figure 3
Special-status species survey results
Fagundes properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE

December 6, 2012

Source: Existing wetlands prepared by Haistead & Associates, 2000 as cited in Live Oak associates 2001; digitized by URS, 2012; aerial imagery of Kings County, 2010

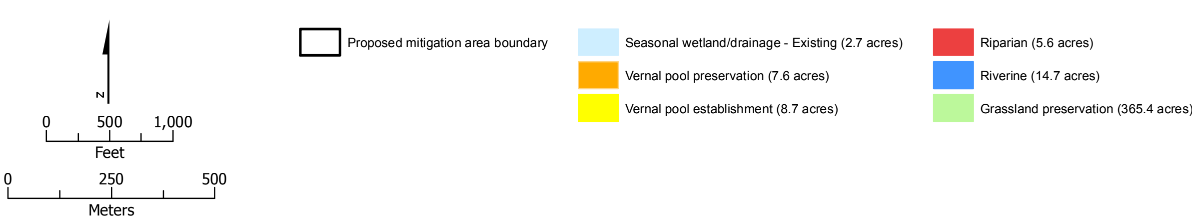


Figure 4
Conceptual restoration map
Fagundes properties

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Memorandum

To: Lupe Jimenez, California High-Speed Rail Authority
Mark McLoughlin, California High-Speed Rail Authority

From: Matthew Bettelheim, URS Corporation
Katherine Dudney, URS Corporation

Date: December 10, 2012

Subject: Analysis of Mitigation Potential at Fagundes Property

The Fagundes property was first identified through stakeholder outreach. In July 2012, landowner Johnnie Fagundes Sr. of Fagundes Agribusiness contacted the California High-Speed Rail Authority (Authority) to propose the Fagundes property, formerly under investigation as a potential mitigation bank in 2000, as candidate mitigation property. In August 2012, Johnnie Fagundes responded to a permission-to-enter mailing, granting permission for the Authority's consultants to access and conduct reconnaissance-level and protocol-level surveys to identify and map suitable mitigation resources on the property. The initial reconnaissance-level survey was performed in August 2012, and a follow-up reconnaissance-level survey was performed in November 2012. In October 2012, title reports were requested for the assessor parcel numbers (APNs) under investigation. The Authority and its consultants have continued to work with Johnnie Fagundes through coordination of the onsite conceptual wetland design.

This revised memorandum provides background information about the Fagundes property and summarizes the results of the analyses conducted to determine the suitability of using the property for wetland mitigation and the feasibility of performing wetland restoration, enhancement, establishment, and preservation onsite to mitigate for aquatic impacts associated with the Fresno to Bakersfield Section of the proposed California High-Speed Train System. The Fagundes property, which is approximately 12 miles northwest of Visalia in Kings County, just east of Fresno, consists of two parcels along Cross Creek: Parcel A (approximately 250 acres) and Parcel B (approximately 150 acres). These parcels have potential to support the rehabilitation, reestablishment, establishment, and preservation of riverine, riparian, vernal pool, and grassland habitats. To prepare a conceptual design for the property, restoration ecologists conducted a desktop analysis of site conditions, including a review of a previously prepared site assessment (Live Oak Associates, Inc. 2001) as well as land use, vegetation, hydrology, soils and climate data. This memo describes the results of this analysis and proposes a restoration design that would be ecologically suitable for the site.

PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

December 4, 2012

Parcel boundary

0 2 4
Miles

0 4 8
Kilometers

Figure 1
Vicinity Map: Fagundes Property

Environmental Setting

The two parcels that make up the Fagundes property (Figure 1) are surrounded by a combination of agricultural lands to the north and west and grasslands to the south (across Cross Creek) and immediately east. The two individual Fagundes parcels are connected by a narrow strip of land that parallels Cross Creek. This strip of land and the adjoining grasslands south of Cross Creek are privately owned, but the Fagundes family grazes these parcels (together with the Fagundes parcels) under a lease with the landowner. Vernal pool complexes are scattered throughout the grasslands on the Fagundes property.

The Fagundes property falls within critical habitat for the federal-listed vernal pool fairy shrimp (*Branchinecta lynchi*) and California tiger salamander (*Ambystoma californiense*). This characteristic of the site makes it particularly valuable for restoration and conservation.

Land Use

Land use adjacent to the Fagundes property is primarily agricultural cropland. The lands surrounding Cross Creek through the property and extending approximately 6 miles upstream represent some of the few remaining natural lands in the vicinity; much of the surrounding area has been converted to row crops. However, the surrounding natural lands and the two Fagundes parcels have been used as pastureland for cattle. Cattle grazing in the area around the parcels is likely to continue to support the Fagundes family, which operates a dairy. The Fagundes family also operates a turkey farm and grows crops, such as kiwifruit (*Actinidia deliciosa*).

Vegetation

Staff from Live Oak Associates, Inc., evaluated the mitigation potential of both parcels and described the results in a 2001 report (Live Oak Associates, Inc. 2001). The report identifies four vegetation communities on the two parcels: alkali grassland, northern claypan vernal pools and swales, riparian habitat, and seasonal wetland drainages. The alkali grassland habitat primarily consists of non-native annual grasses typical of the region. The riparian habitat is discontinuous along Cross Creek; the report attributes this discontinuity in part to cattle grazing limiting recruitment of riparian vegetation. The seasonal wetland drainages occur in areas that may have once been former channels of Cross Creek.

The vernal pools on the Fagundes property are topographic depressions occurring within the alkali grassland (see Figure 2 for a photograph of an example vernal pool). The depressions are characterized by a hardpan soil layer that fills with rainwater, surface runoff, or overflow from Cross Creek and holds water during the rainy season. The depressions typically fill in December or January, and in wet years the water in the pools persists into late April or early May. Live Oak Associates, Inc. (2001), identified 77 vernal pools on the property in 2000. A wetland delineation was prepared but is now out of date and needs to be updated and verified by the U.S. Army Corps of Engineers (USACE). Typical plant species occurring in the pools include slender popcorn flower (*Plagiobothrys stipitatus*), dwarf wooly-heads (*Psilocarphus brevissimus* ssp. *brevissimus*), and swamp timothy (*Crypsis schoenoides*).

Currently, the portion of Cross Creek that runs through the Fagundes property supports very little riparian vegetation (Figure 3). Where riparian vegetation does occur in the property, it is degraded, consisting of scattered trees that provide little in the way of habitat value, creek shading, or nutrient enrichment.

Hydrology

Cross Creek, which flows intermittently with stormwater runoff and irrigation tailwater, forms the southern border of both parcels. Although some U.S. Geological Survey surface water monitoring stations are upstream on Cottonwood Creek (which becomes Cross Creek), these stations are over 20 miles away

and are above the point where Cottonwood Creek breaks into a more diffuse alluvial fan near the Fagundes property. The flow levels in Cross Creek through the property are currently unknown and will need to be further investigated through field measurements.

The Natural Resources Conservation Service soil survey lists the soils within the parcels as primarily Melga silt loam, with some Remnoy very fine sandy loam and Youd fine sandy loam also occurring. These soils are derived from alluvium material and are notably characterized by a restrictive duripan layer at 10 to 20 inches. The soils are slightly saline and poorly drained (NRCS 2012a).

Figure 2
Large vernal pool within the Fagundes property. Photo taken when dry, November 2012.

Figure 3

Riparian vegetation along the edges of Cross Creek as it borders the Fagundes property. Photos taken in August (top two) and November (bottom) 2012.

Climate

The precipitation in the area averages about 10 inches per year (1985–2012). The range of annual precipitation during this period is 4.1 inches in the driest year and 20 inches in the wettest year. Peak rainfall occurs in December through March; little precipitation occurs from June to September (WRCC 2012). Average temperatures in the area range from 37 to 55 degrees Fahrenheit in January and 65 to 97 degrees in July (period of record is 1927–2005) (WWRC 2012). Due to the general high temperatures in the area, the evapotranspiration rates in the area are also high, approximately 0.9 inches/month in December and 8 inches/month in July (CIMIS 1999).

To assess the potential quality and quantity of vernal pool creation on the property, previous studies by Live Oak Associates, Inc. (2001), were reviewed and the annual precipitation was analyzed. The monthly precipitation data from 1971–2000 (including the average, 30th percentile, and 70th percentile precipitation) recorded at WETS (wetlands determination) Station CA9367 (NRCS 2012b) in Visalia were used for the precipitation analysis (see Table 1). The data were similar to the Western Regional Climate Center (WRCC) data for Visalia, which cover 1885–2012; the WRCC data show slightly less average rainfall than the WETS data. The WRCC data did not show any significant difference in the annual rainfall between the period 1971–2000 and the period 2001–2010; therefore, it is assumed that the WETS table, which only covers 1971–2000, still provides an acceptable approximation of the current monthly and annual rainfall for the property.

To meet the USACE guidelines (USACE and EPA 2008) for wetlands, a feature must demonstrate an ability to hold water for a minimum of 5% of the growing season, or 19 days in the Visalia area. This criterion must be met in 5 of 10 years. To assess whether created vernal pools would meet this criterion, the precipitation data were compared with evapotranspiration rates specific to the area (CIMIS 1999). The property is near the transition of evapotranspiration Zones 12 and 16. Zone 12 was used for this analysis because Visalia, where precipitation data were collected, is in Zone 12. However, Zone 16 has slightly higher evapotranspiration rates and results in a slightly more conservative, but similar, result. Because vernal pools are generally unvegetated or contain only small annual plants, no crop coefficient for evapotranspiration was used.

Table 1 shows the results of the comparison of the WETS monthly rainfall data with the evapotranspiration rates. The results of this comparison were used to assess the period that the ponds would be expected to hold water. After reviewing soil descriptions for the area, URS assumed that no soil infiltration and no groundwater contribution would occur due to the known presence of vernal pools and a hardpan. The results of the comparison show that in an average year, more than 19 days of ponding would occur in the months between December and March. In a wet year, more than 19 days of ponding would occur in the months between November and March. In a dry year, more than 19 days of ponding would occur in December and January. To classify a feature as a wetland, only 19 days of ponding per year is needed; due to high rainfall and low evapotranspiration rates, the vernal pools are expected to fill annually in the winter months for at least 19 days. This pattern would be typical for vernal pools in this area and is consistent with observations in the previous report that Live Oak Associates, Inc., prepared for the property in 2001.

Table 1
Precipitation, Evapotranspiration, and Number of Days Ponded by Month in Visalia, California

Month	Precipitation from WETS (1971–2000) (inches) [a] Average	Wet Year [b]	Dry Year [c]	Daily Evapotranspiration Rate (inches)	Ponded > 19 days during month Average	Wet Year [b]	Dry Year [c]
Jan	2.03	2.5	0.81	0.04	Yes	Yes	Yes
Feb	1.95	2.37	0.79	0.07	Yes	Yes	No
Mar	2.15	2.66	0.94	0.11	Yes	Yes	No
Apr	0.82	1.02	0.25	0.17	No	No	No
May	0.38	0.43	0	0.22	No	No	No
Jun	0.14	0	0	0.26	No	No	No
Jul	0.01	0	0	0.26	No	No	No
Aug	0.02	0	0	0.23	No	No	No
Sep	0.25	0.21	0	0.18	No	No	No
Oct	0.65	0.79	0.08	0.12	No	No	No
Nov	1.13	1.44	0.46	0.06	No	Yes	No
Dec	1.49	1.88	0.78	0.03	Yes	Yes	Yes

[a] WETS table from NRCS 2012b. Data record only includes 1971–2000.
[b] Wet year is defined at the 70th percentile of the period of record.
[c] Dry year is defined at the 30th percentile of the period of record.

These data suggest that precipitation is sufficient to support the creation of vernal pools on the Fagundes property that would meet the USACE guidelines for ponding (i.e., at least 19 days a year in 5 of 10 years). It is presumed that if depressions were created on the property to support the appropriate wetland hydrology, other vernal pool characteristics, including vegetation, soils, and wildlife, would follow. (If desired, the period of inundation could be increased by enlarging the catchment basin of the constructed pools by designing a more gradually sloping pond edge that would drain precipitation into the center of the pond.)

Conceptual Restoration

Because vernal pools are already present on the Fagundes property and soils are mapped as conducive for vernal pool formation, vernal pool establishment is feasible on the property. The conceptual restoration design would involve establishing additional vernal pools in suitable areas and restoring Cross Creek and tributaries by rehabilitating and enhancing the riparian corridor and associated seasonal wetlands. The proposed vernal pool establishment is based on the findings of the Live Oak Associates, Inc., report (2001) and will be further evaluated for feasibility in the field at a later date.

The conceptual restoration design would restore, enhance, establish, and preserve wetlands and native vegetation communities to approximate the historical landscape based on the existing conditions of onsite vernal pools and those on nearby reference sites. During the development of this conceptual restoration design, parcel boundaries were found in some cases to be inconsistent with the creek channel on which they were originally mapped. To synchronize this analysis with the acreage estimates, the mitigation areas and acreages were limited to onsite locations where restoration activities are expected to take place. The mitigation areas were identified and defined to follow the prevailing landscape features on the

Fagundes property (e.g., the centerline of Cross Creek, which is the southern boundary of both parcels) and the surrounding agricultural parcels (which form the northern and western boundaries of both parcels). Elsewhere, where sufficient data were available, conventional APN boundaries and fence lines were used, such as along the eastern boundary of Parcel A, which is separated from adjacent grazing lands by a fence. In the conceptual banking proposal prepared by Live Oak Associates, Inc. (2001), the authors evaluated the potential for vernal pool establishment and determined that the site could support the establishment of 17.55 acres of vernal pools. This assessment was based on constructing ponds with a minimum distance of 200 feet between them. The total density of pools at the site was limited to 7% of the area based on observations of natural densities found in natural vernal pool complexes (Live Oak Associates, Inc. 2001).

For the current analysis, RC biologists hand-digitized, compared, and overlaid the existing and proposed vernal pool features identified in the Live Oak Associates, Inc., report (2001) on current aerial imagery of the Fagundes property (Figure 4). These vernal pool features, as proposed, appear to be complementary to the existing site conditions. Larger ponds are proposed within some ephemeral drainage channels, which would increase the catchment basin of the pools. Proposed locations for creation are clustered in areas that currently lack pools. By clustering the pools to be established rather than distributing them evenly across the property, impacts to the sensitive species associated with the existing ponds would be limited and the total area disturbed would also be limited. The total amount of vernal pool establishment proposed here is less than that proposed by Live Oak Associates, Inc. (2001), because the authors of the report proposed creation outside of the property fence line that defines the mitigation property boundary in this analysis.

In addition to vernal pool establishment, the Fagundes property provides opportunities for riparian rehabilitation and riverine preservation. Because Cross Creek serves as the property boundary, it is assumed that only half of the area of the river and its associated riparian habitat could be used as mitigation for the Fresno to Bakersfield Section. Table 2 lists the total area in acres or distance in linear feet proposed for the preservation, rehabilitation, or establishment of vernal pool, seasonal wetland, riparian, riverine, and grassland habitats. These amounts may be updated as a result of a more detailed wetland delineation of the site, assessment of the hydrology of Cross Creek, and further evaluation of the area proposed for vernal pool creation.

Because Cross Creek is intermittent and its waters are limited, the ecosystem will likely not support large expanses of riparian cover. However, small remnant patches of riparian vegetation suggest that a small riparian corridor of approximately 20 feet in width is feasible. Along Cross Creek within the property (i.e., only one side of the creek), a 20-foot-wide riparian corridor, which would provide about 5.6 acres of riparian rehabilitation/enhancement, is proposed. This proposed area for the riparian corridor is less than the 7.6 acres discussed in the Live Oak Associates, Inc., report (2001), but that report estimated a wider riparian buffer than estimated in this analysis and considered vegetation along some of the Cross Creek tributaries to be riparian, which this analysis does not.

In addition to the vernal pool establishment and riparian enhancement/rehabilitation shown on Figure 4, it may be possible to support a riparian or seasonal wetland community along some of the tributaries to Cross Creek. The potential to support these habitats will be further analyzed once additional information about the hydrology and topography of the tributaries has been assessed.

Table 2
Conceptual Restoration Design Area

Resource Type	Acre(s) / Linear Feet	Average CRAM Score	Mitigation Category
Vernal pool*	7.6 acres	N/A	Preservation
	8.7 acres	N/A	Establishment
Seasonal wetland*	2.7 acres	N/A	Preservation
	13,250 linear feet	N/A	Preservation
Riparian*	5.6 acres	N/A	Rehabilitation/enhancement
Riverine**	14.7 acres	N/A	Rehabilitation/enhancement
	19,000 linear feet	N/A	Rehabilitation/enhancement
Grassland	365.4 acres	N/A	Preservation

*Acreage estimated using aerial images and previous report prepared by Live Oak Associates, Inc. (2001). These numbers will be confirmed as part of a future wetland delineation. Seasonal wetland drainages are assumed to be 5 feet wide. The riparian corridor assumed to be 20 feet wide.
**Riverine acreage and linear feet include the entire width of Cross Creek and tributaries, as shown on Figure 4.
ac = acres
lf = linear feet
N/A = not available

Restoration of riparian cover along Cross Creek would involve planting the appropriate riparian species (to be based on the species currently growing in the area), irrigating during plant establishment, and installing riparian exclusion fencing or fencing around plantings to protect them from cattle grazing. It is unknown whether cattle grazing will be permitted on the property in the future. Cattle grazing is not expected to conflict with the restoration objectives and may be desirable (e.g., in the reduction of aboveground biomass to enhance wildlife habitat). However, if grazing is permitted, a grazing plan will need to be prepared and approved by agencies to ensure that grazing does not conflict with the restoration goals. If Cross Creek is currently used as a watering source for the cattle, an alternative water source, such as pumping water into troughs away from the creek, may be needed.

In addition to wetlands and waters, protection and restoration of grasslands and riparian habitat on the Fagundes property may also be valuable to special-status species that use these habitats. The Live Oak Associates, Inc., report (2001) states that previous studies have identified federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp (*Lepidurus packardi*) onsite. Other species identified as having potential to occur in or use the property include the federal- and state-listed American peregrine falcon (*Falco peregrinus anatum*) and San Joaquin kit fox *(Vulpes macrotis mutica*), the state-listed Swainson's hawk (*Buteo swainsoni*), and numerous other species of concern. URS biologists observed burrowing owls (*Athene cunicularia*), a state species of special concern, during the August 2012 field visit.

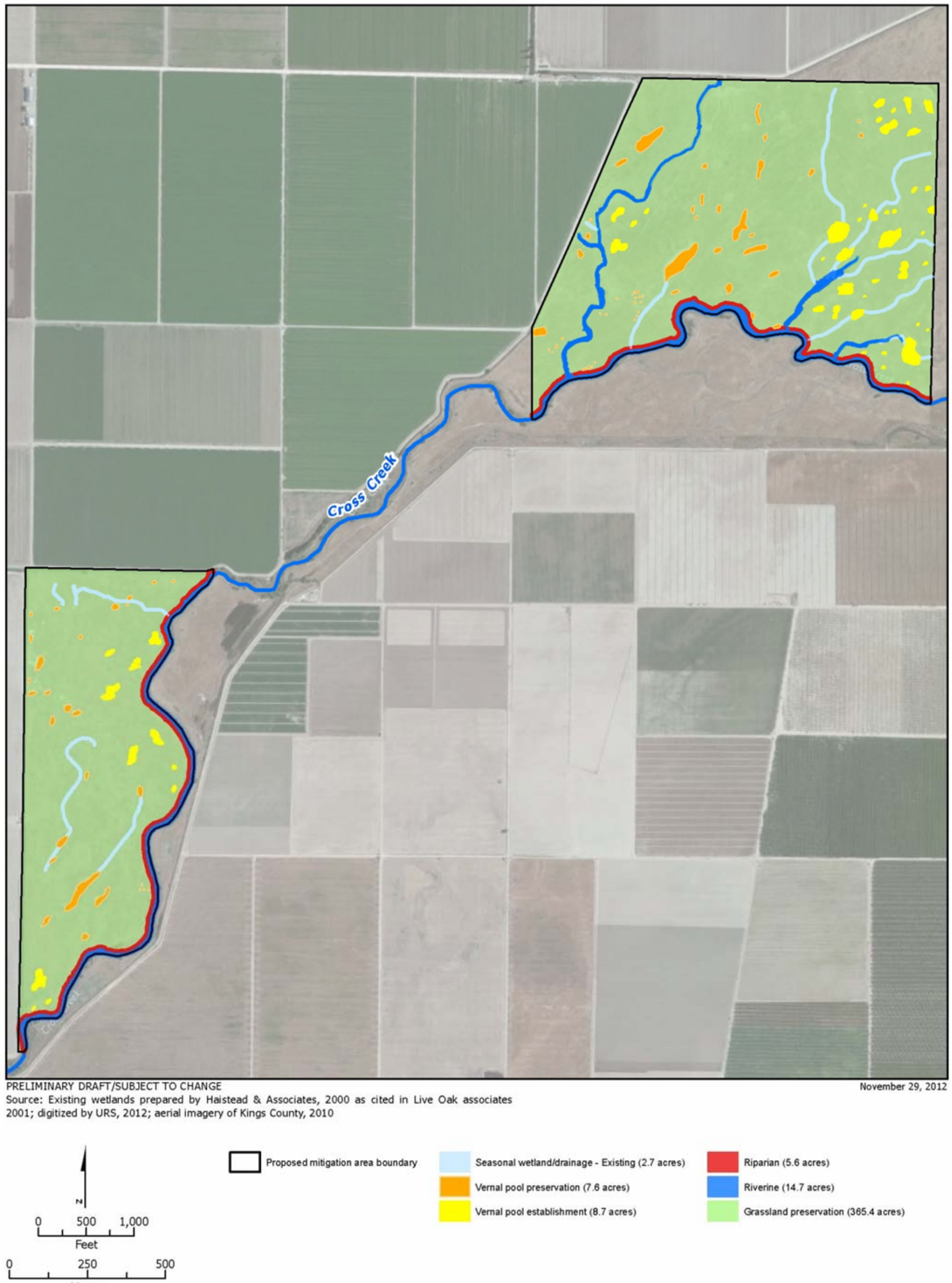

Figure 4
Conceptual restoration map: Fagundes property

Next Steps

Although the proposed areas for vernal pool establishment appear feasible, additional information on the site topography is needed to further develop a plan to determine the proposed features to be enhanced, established, or restored. Topographic data should have a maximum interval of 1 foot and could be collected through surveying the site or by purchasing light detection and ranging (LiDAR) imagery. The purchase of LiDAR imagery is recommended for its efficiency and accuracy. The next phase of design would consider natural topographic depressions and an updated wetland delineation (conducted by the Authority or supplied by the property owner) to develop the details of the sizes and locations of the created pools and restored riparian habitat. Field soil investigations should determine the soil hydraulic conductivity rates and confirm the presence and depth to the local hardpan in areas of expected vernal pool creation. The designed depressions would be shallow (likely less than 15 inches in depth) to preserve the natural hardpan layer that is vital to the success of vernal pool creation. A fluvial-geomorphic analysis of Cross Creek and associated tributaries should be conducted to determine the extent of potential riparian restoration. Coordination with adjacent landowners is recommended to determine the feasibility of restoring riverine and riparian habitat on both sides of Cross Creek.

Additional information is needed before a restoration plan can be fully developed. Next steps include:

- Obtain either LiDAR data or topographic survey data for the Fagundes property.
- Obtain or conduct an updated wetland delineation for the property to assess the current size and locations of the vernal pool, wetland, riverine, and riparian habitats onsite. The new delineation needs to be verified by USACE.
- Survey for vernal pool fairy shrimp or other sensitive species if desired for additional mitigation credit or obtain verified survey results for these species.
- Conduct a California Rapid Assessment Method (CRAM) analysis of the property to assess the current condition of the wetland complexes and assess whether any improvements are desirable to increase habitat quality.
- Conduct field soil surveys to determine the soil characteristics (e.g., soil depth to hardpan, depth of the hardpan, soil conductivity rates) necessary for vernal pool creation.
- Design the vernal pools for the property, including their quantity, locations, depths, and sizes, based on topographic data and existing wetland features.
- Conduct fluvial-geomorphic assessments of the condition and stability of and potential opportunities for the riverine and riparian restoration of Cross Creek and the existing tributaries or the establishment of additional habitat features. Determine the typical duration and timing of channel flow, which may support riparian vegetation. These studies should be conducted during the winter, when the creek has flows.
- Design a riparian restoration plan based on a survey of existing habitat(s) and reference sites.

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C7.0 Peck Island Properties

The Peck Island properties were first identified through stakeholder outreach. In July 2012, Vulcan Material's environmental consultant Scott Larson of ESR, Inc., contacted the Authority to propose the Peck Island properties as candidate mitigation properties. The initial reconnaissance-level survey was performed by RC biologists in August 2012 accompanied by Vulcan Material consultant Russell Austin, and in October 2012 a draft conceptual analysis of wetland restoration and establishment potential was performed. In October 2012, title reports were requested for the APNs under investigation. The Authority and its consultants have continued to work with Scott Larson and Russell Austin through the coordination of conceptual wetland design onsite.

The Peck Island properties consists of 18 adjacent assessor parcel numbers (APNs) in Fresno County. The 18 parcels total approximately 414 acres that cover approximately ¾ of the northeast portion of Peck Island contiguously (the remaining ¼ of the island is privately owned) and include a combination of active irrigated agricultural fields (207 acres) and ruderal habitat (41 acres) at the center of the island surrounded by natural oak woodland (35 acres) and riparian (125 acres) around the island's perimeter. Peck Island is an actual island within the Kings River alluvial fan, bounded by the main Kings River channel to the north and a combination of river braids to the south.

The lands immediately surrounding Peck Island fall within the alluvial fan and include predominantly active agricultural land to the south and southwest, an aggregate gravel mine to the north, and undisturbed natural lands to the east. The southern ¼ of Peck Island (downstream) has been converted into what appear to be holding or detention ponds. At various locations along the Kings River and the river braids, the far banks (offsite) support additional stands of natural oak woodland and riparian habitat. Outside of the Kings River alluvial fan, the island is bounded by State Route 180 (SR-180) to the north, E. Annadale Ave. to the south, the City of Sanger to the west, and the beginning of the Sierra Foothills to the northeast (Figure 1). Together with portions of the natural land within the Kings River alluvial fan, the Peck Island properties and the surrounding natural lands provide approximately 1,930 acres of contiguous open space suitable for special-status wildlife species between I-180 and E. Annadale Ave.

The preservation and potential restoration, enhancement, and establishment of the existing onsite wetlands, oak woodland, and riparian habitat would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level. In the Tulare Basin Wildlife Partners' integrated resource management program, called the Tulare Basin Watershed Initiative, the Peck Island properties are in the Kings River Riparian planning area, where various wildlife and wetland conservation projects have been proposed or are under consideration.

C7.1 Wetland Resources

C7.1.1 Reconnaissance Surveys

The Peck Island properties are within the Tulare-Buena Vista Lakes HUC-8 watershed. Site visits conducted in 2012 documented the extent of active agricultural fields and natural oak woodland and riparian habitat, and the conditions of the Kings River riparian corridor surrounding the island in general (photo, right; Figure 2). In addition to the Kings River main channel, several unnamed side-channel

braids parallel or bisect portions of the island. A former, historical ephemeral high flow channel was also identified from a 1924 USGS 7.5 quadrangle map on the north end of the island connecting two side-channel braids (Figure 4).

The soils within the agricultural fields onsite have been primarily mapped as the Grangeville series, consisting of fine sandy loam, whereas the surrounding riparian corridor has been mapped as the Tujunda series, consisting of cobbly loamy sand. Both of these soils series are associated with flood plains and alluvial fans. Such loamy soils and river cobble were evident throughout the fallow and recently tilled agricultural fields.

C7.1.2 Environmental Stressors

The stressors identified during the reconnaissance survey include the active irrigated agricultural fields throughout the island that have replaced the island's natural oak woodland and riparian habitat and riverine hydrology. Onsite there are two homes, an 80-foot by 50-foot shop building, an irrigation system and a separate sprinkler system, and 7.5-foot tall deer fencing fully encircling the entire perimeter of the Peck Island parcels. North of the Kings River main channel lies the Vulcan Materials aggregate mining operation, which includes off-channel silt and supply ponds.

C7.2 Wildlife Assessment

C7.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on August 20, 2012, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Peck Island properties were irrigated agricultural fields (e.g. orchard, vineyard, irrigated row crops), and natural oak woodlands and riparian habitat that border the Kern River and off-channel braids within the alluvial fan and encircle the agricultural fields. These parcels are within the Kern River Corridor, and lie within the Kings River Missing Linkage. The natural vegetation communities present onsite provide relatively undisturbed, high-quality habitat suitable for Swainson's hawk (*Buteo swainsoni*) and Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). These species have been reported in the vicinity, and have been reported or have the potential to be present on the properties.

C7.2.2 Desktop Review

RC GIS specialists conducted a CNDDB query with a 5-mile radius of the property for the species requiring mitigation (Figure 1). The closest reported Swainson's hawk observation is approximately 15 miles southwest along Highway 43, west of Kingsburg in 2000. The mature riparian corridor present surrounding the properties could provide suitable nesting habitat for nesting pairs, and the onsite and surrounding agricultural lands and off-site annual grasslands in the adjacent alluvial fan provide suitable foraging habitat for the species.

Valley elderberry longhorn beetle were last reported on the Peck Island properties in 1998. The riparian corridor includes large elderberry shrubs (*Sambucus* sp.) throughout the property, which provide suitable habitat for the species.

C7.2.3 Focused Wildlife Surveys

On August 20, 2012, RC biologists conducted a reconnaissance survey to map baseline conditions and determine the presence of special-status wildlife species on the Peck Island properties. Additional protocol-level surveys may be required to identify other special-status wildlife species. Swainson's hawk surveys would be performed in the spring and summer and valley elderberry longhorn beetle surveys between February 15 and June 30 to coincide with the appropriate survey windows (see table below).

Further consultation will be required with CDFW and USFWS to discuss this potential mitigation site and agencies' determination of the current presence of species.

Target Species	Survey Timing											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Swainson's hawk												
valley elderberry longhorn beetle												

Class	Common Name	Scientific Name
birds	wood duck	*Aix sponsa*
	common merganser	*Mergus merganser*
	California quail	*Callipepla californica*
	great egret	*Ardea alba*
	turkey vulture	*Cathartes aura*
	red-tailed hawk	*Buteo jamaicensis*
	mourning dove	*Zenaida macroura*
	short-eared owl	*Asio flammeus*
	Anna's hummingbird	*Calypte anna*
	belted kingfisher	*Megaceryle alcyon*
	acorn woodpecker	*Melanerpes formicivorus*
	Nuttall's woodpecker	*Picoides nuttallii*
	black phoebe	*Sayornis nigricans*
	Say's phoebe	*Sayornis saya*

Class	Common Name	Scientific Name
	western kingbird	*Tyrannus verticalis*
	barn swallow	*Hirundo rustica*
	bushtit	*Psaltriparus minimus*
	American robin	*Turdus migratorius*
	varied thrush	*Ixoreus naevius*
	European starling	*Sturnus vulgaris*
	spotted towhee	*Pipilo maculatus*
	song sparrow	*Melospiza melodia*
	house finch	*Haemorhous mexicanus*
mammals	California ground squirrel	*Otospermophilus beecheyi*
	raccoon	*Procyon lotor*
	desert cottontail	*Sylvilagus audubonii*
	coyote	*Canis latrans*

Summary

A summary of species' presence, either confirmed or presumed, on the Peck Island properties is provided here.

- Swainson's hawks: No Swainson's hawks were observed during the reconnaissance survey in mid-August. The trees on the property are large enough to support a Swainson's hawk nest. Abundant small-mammal activity provides a good prey base for hawks.
- Valley elderberry longhorn beetle: Presence has been confirmed onsite within the riparian corridor; additional surveys could be performed to map elderberry shrubs and document the distribution and abundance of valley elderberry longhorn beetle elsewhere on the property.

C7.3 Conceptual Restoration

C7.3.1 Reconnaissance Surveys

Based on the October 4, 2012, *Analysis of Mitigation Potential on Peck Island* technical memorandum (URS/HMM/Arup Joint Venture 2012a), the preliminary conceptual restoration designs currently under consideration involve restoring the Peck Island properties to a natural landscape that would approximate the historic vegetation communities once present onsite prior to the island's conversion to irrigated agricultural fields. Reference sites where such historical vegetation still persists intact can be found adjacent to, and up- and downstream of Peck Island along the Kings River and associated river braids, and were used as the primary model for the preliminary conceptual restoration designs.

Under the preliminary design, conceptual restoration involves restoring, enhancing, or reestablishing the active irrigated agricultural fields and ruderal habitat to oak woodland and riparian habitat, while the remaining existing oak woodland and riparian habitat would be preserved. An estimated 157 acres of riparian reestablishment/establishment, 1.5 acres of

riparian rehabilitation/enhancement, 100 acres of riparian preservation, and 31.7 acres of riverine preservation, together with an estimated 83.3 acres of oak woodland reestablishment/establishment, have been proposed on the Peck Island properties.

In addition, the preliminary designs involve reestablishing the historical ephemeral high-flow channel identified on the northern end of the island to reconnect two existing side-channel braids, as well as establishing two additional side-channel braids and three seasonal wetlands (Figure 4). The exact dimensions and locations of these side-channel braids (approximately 5,000 linear feet total) and seasonal wetlands (estimated 4-acre total) would be developed in more detail upon further evaluation of the site topography and groundwater table. Based on the preliminary designs, these seasonal wetland features would be constructed in accordance with the high groundwater table such that their hydrology is largely supplied by groundwater with some rainwater inputs and overtopping from the river and drainages.

C7.4 Next Steps

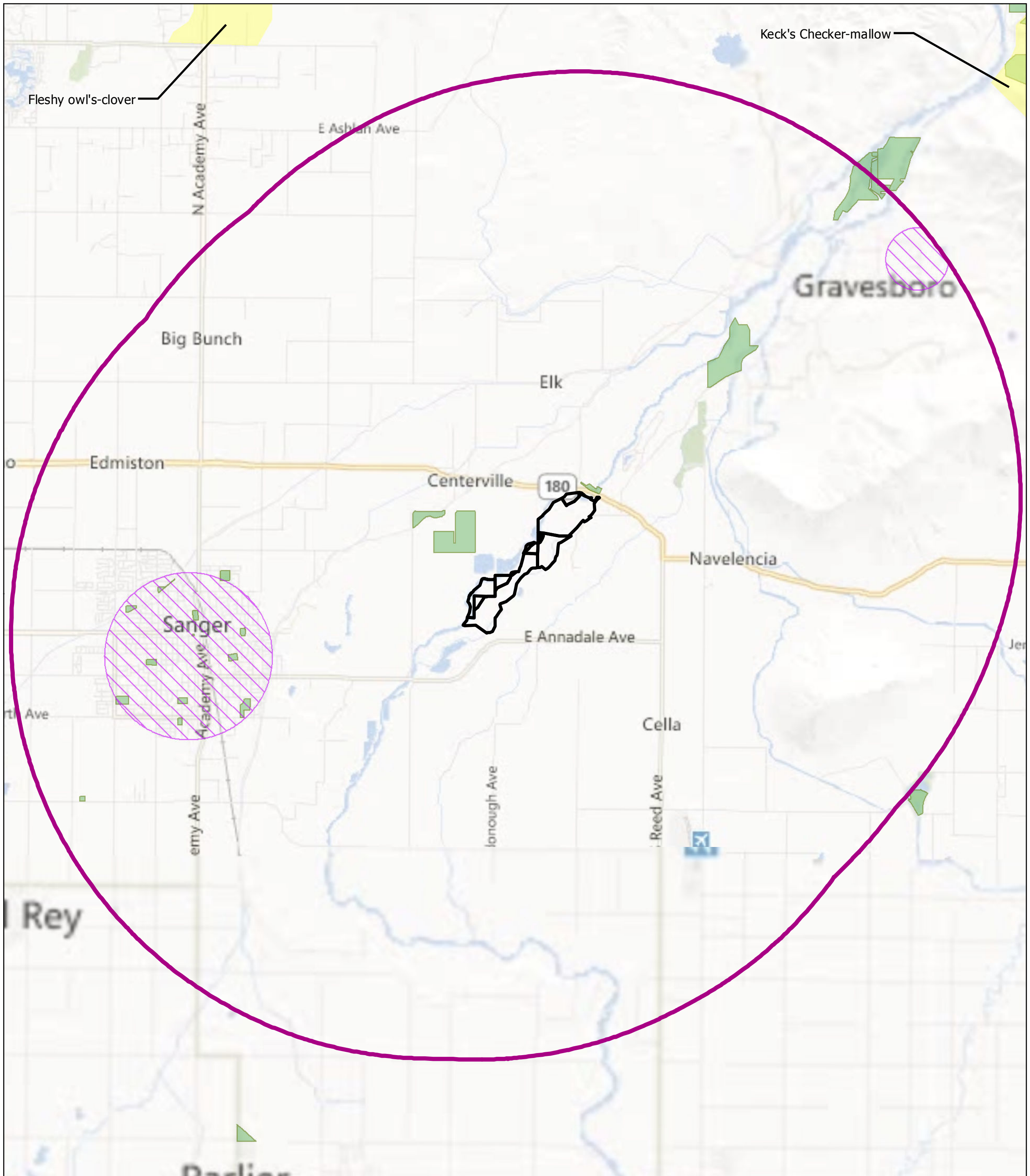
Aquatic and upland habitats on the properties provide suitable opportunities for restoration, enhancement, reestablishment, and preservation.

Follow-up surveys for the Swainson's hawk during the first two weeks of April 2013 and valley elderberry longhorn beetle surveys between February 15 and June 30 may confirm the presence, abundance, and distribution of these species. The proposed oak woodland and riparian woodland reestablishment would augment the mature trees on the properties to encourage Swainson's hawk to nest and forage onsite. This site would also be an excellent candidate as a conservation area for elderberry shrub transplants.

Future coordination with agency personnel will be critical in the development of a conservation easement on the property, and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

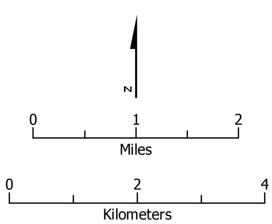
Peck Island Properties (414 acres)	
Resource Type	**Acreage Available**
Uplands	
Oak woodland	83.3 ac reestablish/establish
	35 ac preservation
Riparian	157 ac reestablish/establish
	1.5 ac rehabilitate/enhancement
	100 ac preservation
Wetlands	
Vernal pool	N/A
Seasonal wetland	4 ac establishment
Riverine	31.7 ac preservation
	2.3 ac reestablish/establish
Wildlife	
vernal pool fairy shrimp	N/A
vernal pool tadpole shrimp	N/A
blunt-nosed leopard lizard	N/A
Swainson's hawk	414 ac
western burrowing owl	N/A
Nelson's antelope squirrel	N/A
Tipton kangaroo rat	N/A
San Joaquin kit fox	N/A

ac = acres
N/A = not applicable



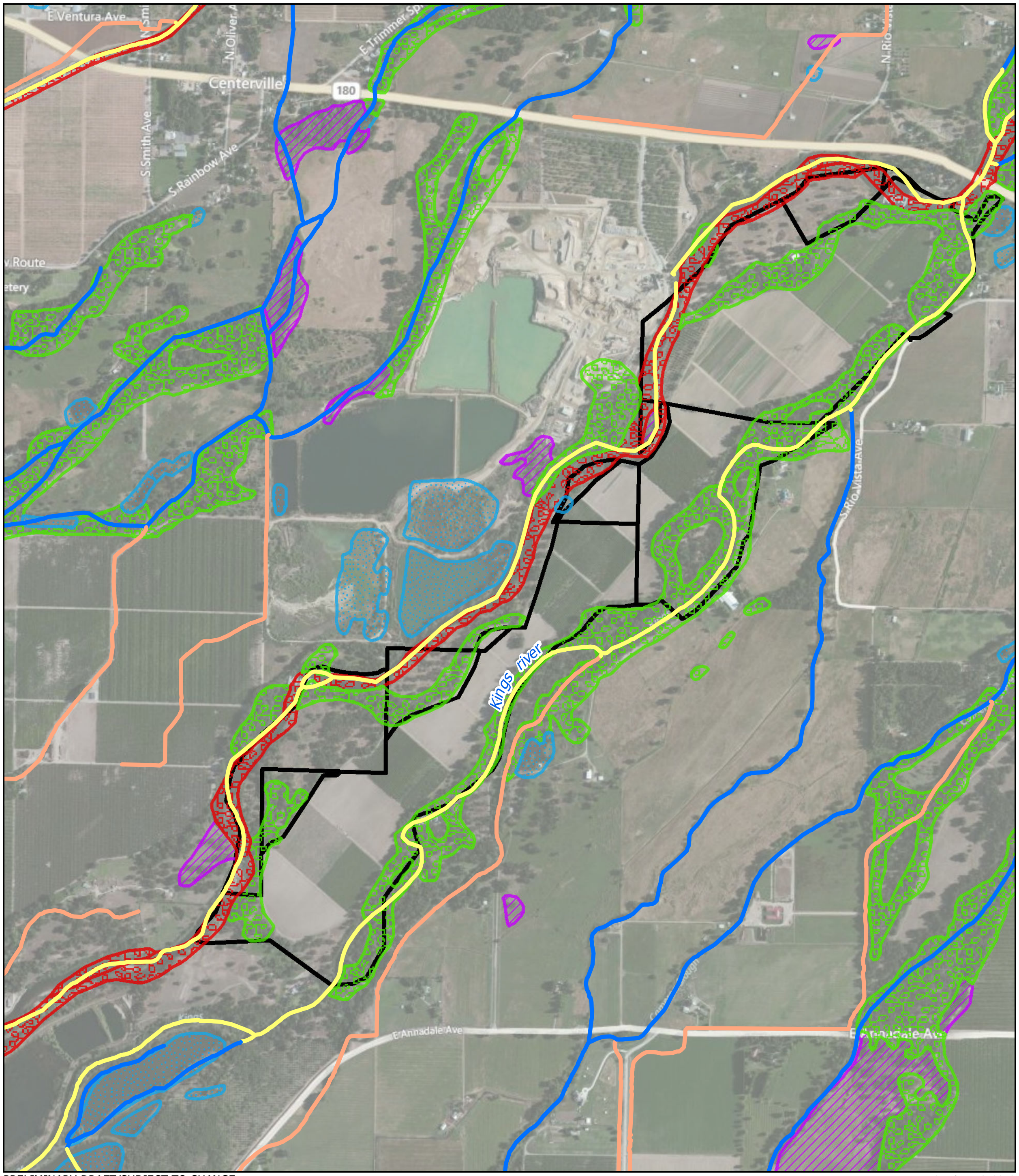
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: Bing Imagery maps, CNDDB 2012

December 6, 2012



- San Joaquin kit fox
- Parcel boundary
- 5-mile buffer
- Public lands
- Critical habitat

Figure 1
CNDDB occurences and critical habitat
Peck Island properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012, U.S.,NWI data is from Fish and Wildlife Service 2012 & NHD data is from USGS.

October 16, 2012

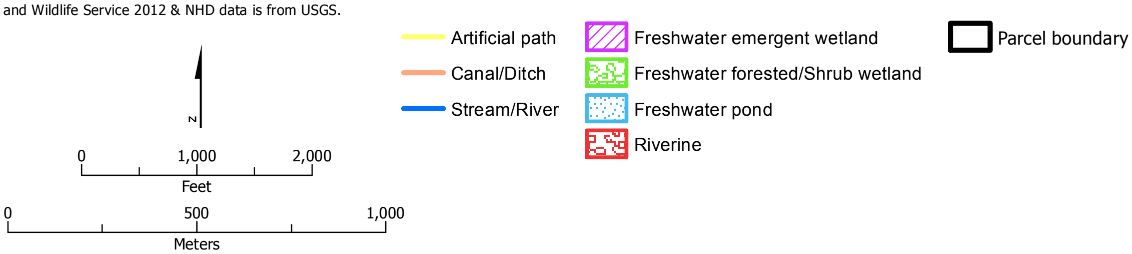
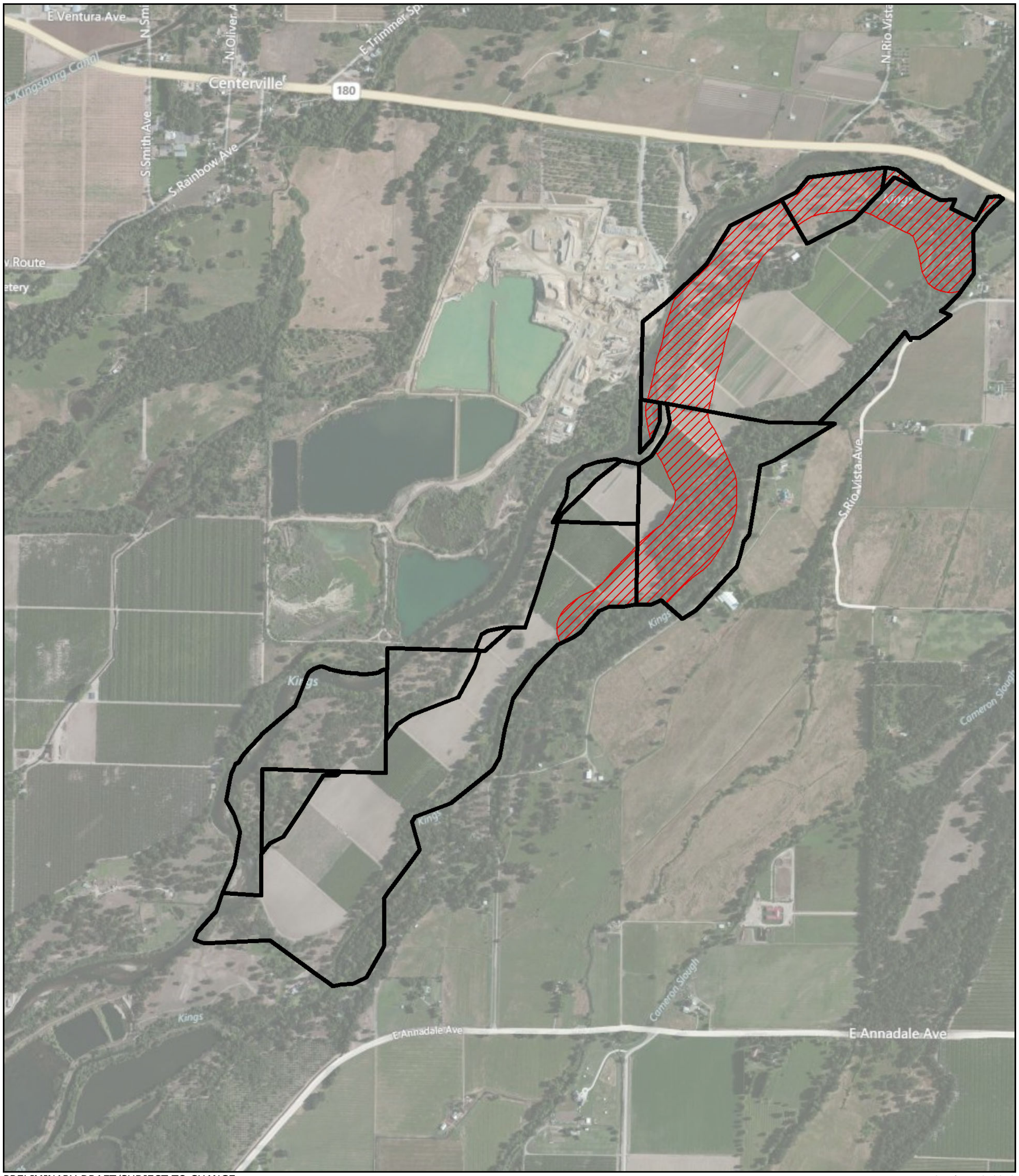


Figure 2
Wetland survey map
Peck Island properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012 & CNDDB, 2012

October 16, 2012

N

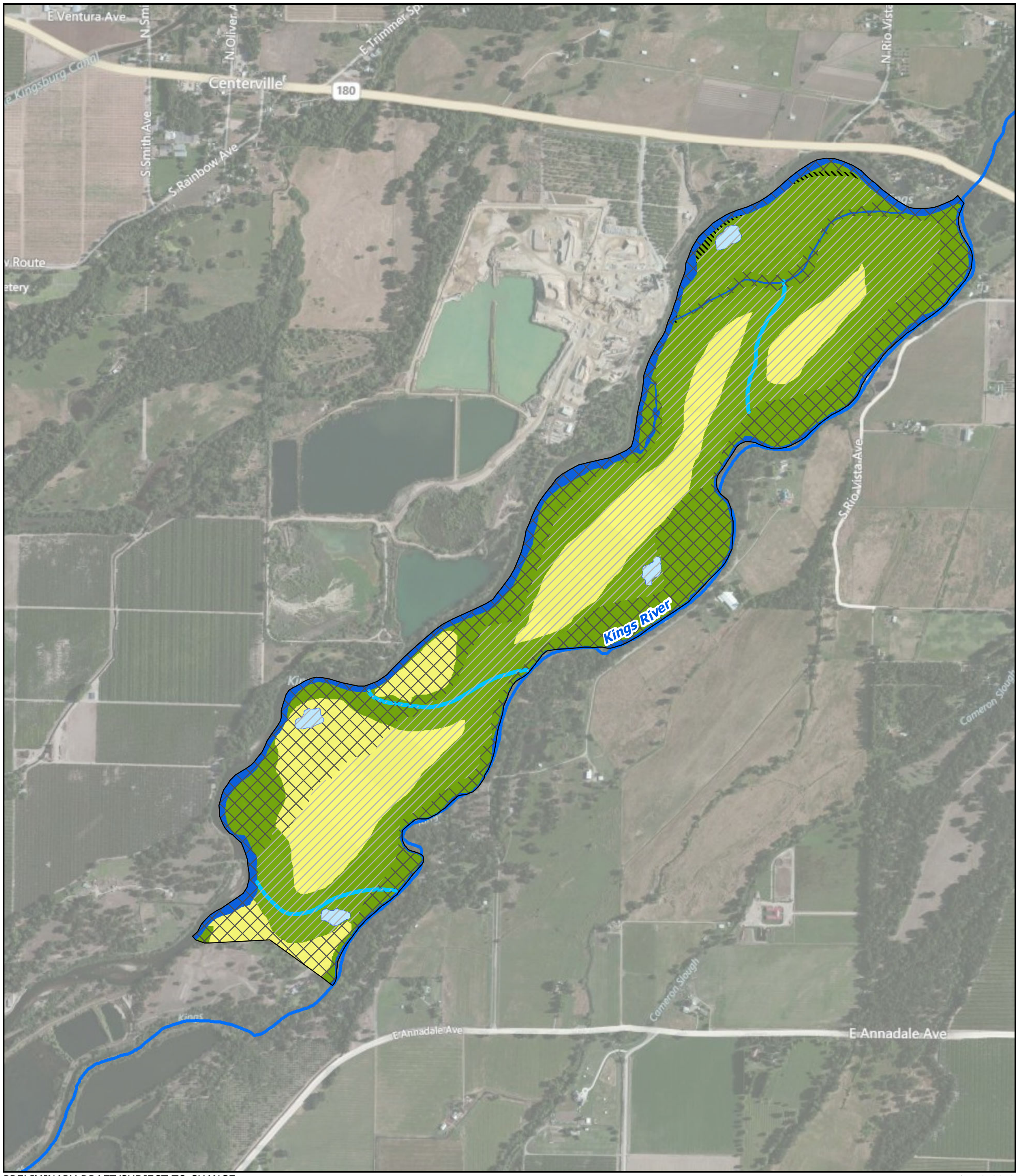
0 1,000 2,000
Feet

0 500 1,000
Meters

CNDDB species records
Valley elderberry longhorn beetle

Parcel boundary

Figure 3
Special-status species survey results
Peck Island properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

December 6, 2012

N

0 500 1,000
Feet

0 250 500
Meters

Proposed mitigation area boundary
Enhancement/Rehabilitation
Preservation
Reestablish/Establish

Established channel (2.3 acres)
Oak woodland (119.2 acres)
Riparian (258.3 acres)
Riverine (31.7 acres)
Established seasonal wetland (approx. 3-4 acres)

Figure 4
Conceptual restoration map
Peck Island properties

URS/HMM/Arup Joint Venture
2870 Gateway Oaks Drive, Suite 150
Sacramento, CA 95833
Tel: (916) 679-2000
Fax: (916) 679-2900

Memorandum

To: Lupe Jimenez, California High-Speed Rail Authority
Mark McLoughlin, California High-Speed Rail Authority

From: Matthew Bettelheim, URS Corporation
Katherine Dudney, URS Corporation

Date: December 10, 2012

Subject: Analysis of Mitigation Potential at Peck Island

The Peck Island property was first identified as a potential mitigation site through stakeholder outreach. In July 2012, Vulcan Material's environmental consultant, Scott Larson of ESR, Inc., contacted the Authority to propose the Peck Island property as a candidate for mitigation. The initial reconnaissance-level survey was performed by RC (regional consultant) biologists in August 2012 accompanied by Vulcan Material consultant Russell Austin. In October 2012, title reports were requested for the assessor parcel numbers (APNs) under investigation. The Authority and its consultants have continued to work with Scott Larson and Russell Austin through the coordination of conceptual wetland design on site.

This revised memorandum provides background information about the Peck Island property and summarizes the results of the analyses conducted to determine their suitability for wetland mitigation and the feasibility of performing wetland restoration, enhancement, establishment, and preservation on site to mitigate for aquatic impacts associated with the Fresno to Bakersfield section of the proposed High Speed Train system. To prepare a conceptual design for the site, restoration ecologists performed a desktop analysis of historical and existing site conditions, including soils, hydrology, vegetation, climate, and reference sites. This memo further describes these analyses and proposes a restoration design that would be ecologically suitable for the site.

Environmental Setting

The Peck Island property (Figure 1) consists of 18 adjacent APNs in Fresno County. The 18 parcels include a combination of active irrigated agricultural fields and ruderal habitat at the center of the island surrounded by natural oak woodland and riparian around the island's perimeter (vegetation mapping provided by Larson, personal communication 2012). Peck Island is an actual island within the Kings River alluvial fan, bounded by the main Kings River channel to the north and a combination of river braids to the south. The property lies approximately 15 miles east of Fresno and 3 miles east of Sanger, CA. Agricultural fields include orchards, vineyards, cover crops, and fallow parcels interspersed within a corridor surrounded by two braids of the Kings River. The property has only one point of entry, which is on the northeastern side via the East Lone Oak Avenue bridge.

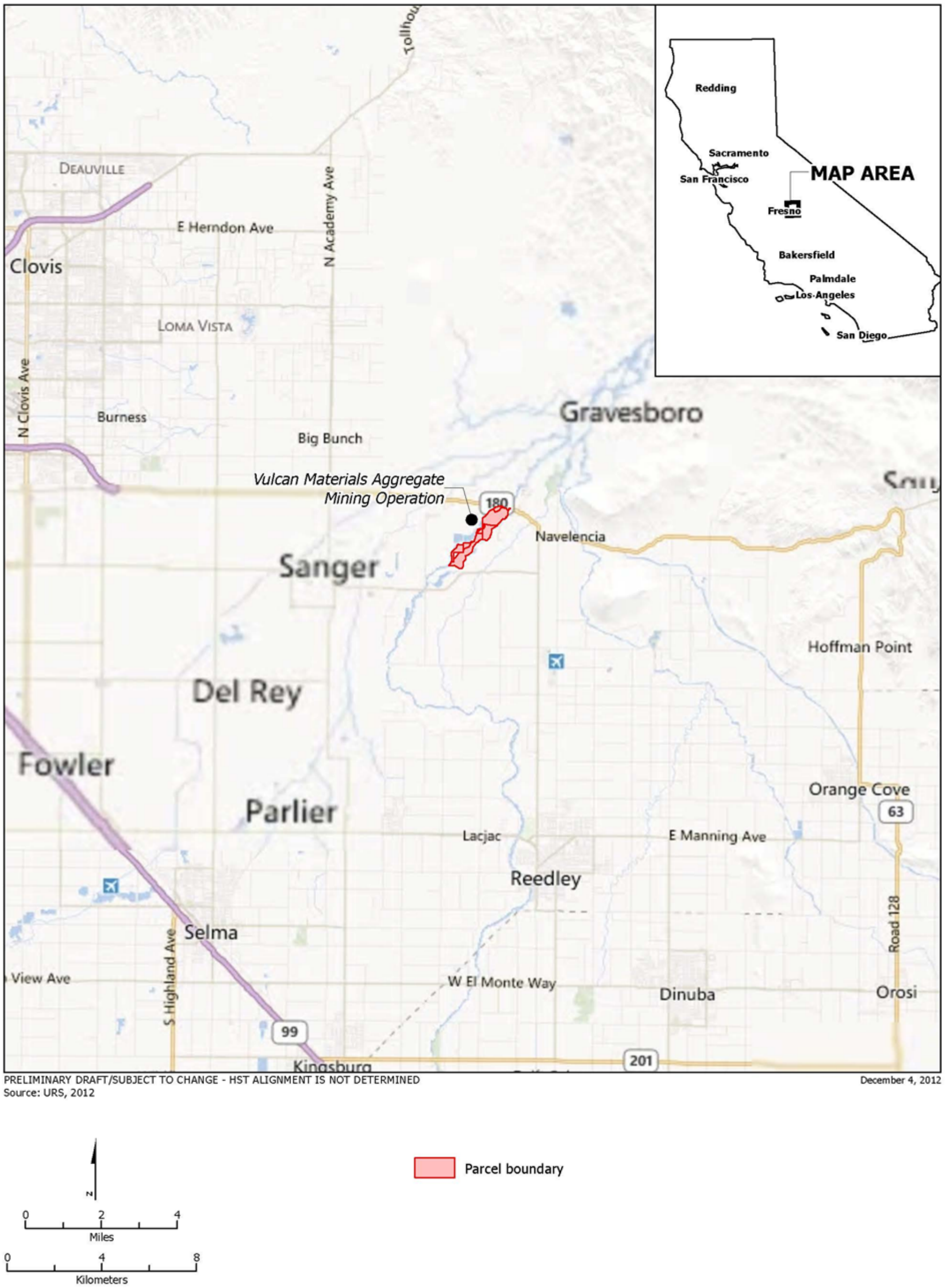


Figure 1
Vicinity Map: Peck Island property

Land Use

Land use in the area surrounding Peck Island is primarily agricultural, with some residential development in the town of Sanger to the west. In addition, right next to the property on its northwestern side is an active aggregate mining operation, also owned by Vulcan Materials. The current operations consist of a plant site and several man-made ponds. Vulcan may retire this mining operation in the future, and is investigating additional restoration at the plant site of as much as 840 acres.

Currently, the Peck Island property includes several well-maintained structures: two homes, a shop building, an irrigation system, a sprinkler system to minimize road dust, and deer fencing. The preliminary title report has not yet been reviewed to assess whether the property has any existing encumbrances, but the title will be evaluated if this site is further considered for mitigation.

Vegetation

The vegetation communities (oak woodland, riparian, mixed agriculture) present on Peck Island are typical of the surrounding area, where agricultural land under predominantly agricultural land use is interspersed with riparian habitat along braids of the Kings River alluvial fan that extends out of the Sierra Nevada. Reference sites immediately up- and downstream and paralleling the island containing relatively intact native vegetation show dense riparian cover with scattered patches of oak woodland on higher islands within the braids.

Figure 2 shows photographs of the riparian areas in the property that could be rehabilitated, enhanced, or preserved. Figure 3 is a photograph of agricultural fields where native vegetation could be reestablished.

Figure 2
Riparian Area

Figure 3
Fallow agricultural field (foreground) with orchard (background)

Hydrology

The Peck Island property is within the Tulare-Buena Vista Lakes HUC-8 watershed. The Kings River, which surrounds the property, is a perennial river that flows from the central Sierra Nevada's western slopes. In the area just east of Sanger, CA, the Kings River flows out of the Sierra Nevada foothills and disburses into a large alluvial fan of many channels. The formation of islands, like Peck Island, within the braids of these channels is common. Historically, the Kings River flowed into Tulare Lake and supported a large wetland complex; however, due in part to the construction of the Pine Flat Dam, which limits water releases, and extraction for irrigation, much of the historic Tulare Lake wetlands have been lost.

In the late 1800s, users along the river began building canals to divert water for irrigation. In 1947, the U.S. Army Corps of Engineers started building the Pine Flat Dam, approximately 13 miles upstream of Peck Island, and completed the project in 1954. The dam serves to mitigate floods, generates hydropower electricity, and provides summer flow releases for irrigation use. Just downstream of the Pine Flat Dam are several stream monitoring gauges maintained by the USGS California Water Science Center (e.g., USGS 11221500 Kings R Bl Pine Flat Dam Ca, USGS 11221000 Pine Flat Lk Nr Piedra Ca, and USGS 11222000 Kings R A Piedra Ca) that measure daily discharge. Daily discharge data from USGS station 11221500 (post Pine Flat Dam) and USGS station 11222000 (pre Pine Flat Dam) were assessed to consider potential flow rates and seasonality of flows through the site.

Figures 4 and 5 are included to show that although Pine Flat Dam altered flows on the Kings River, seasonal patterns still exist. These figures depict average, minimum, and maximum of the daily mean discharge data from 1900-1947 and from 1954-1990 (in cubic feet per second, cfs) of the Kings River upstream of Peck Island. Nearby braids in the Kings River with similar site conditions are evidence that post dam hydrology is capable of supporting robust riparian habitats.

Figure 4 represents 1900-1947 data, a period before the construction of the Pine Flat Dam. During this period, average flows in the Kings River were highest in May and June, approximately 7,500 cfs. This pre-dam higher flow is presumed to be primarily from snowmelt. Storm events, typically from November to March, resulted in temporarily spikes in flow, shown as maximum flow in Figure 4.

Figure 5 shows 1954-1990 data, a period after the construction of the Pine Flat Dam. Average peak flows are still highest in May and June, around 6,500 cfs, but unlike the pre-dam condition, flows in the Kings River after the construction of Pine Flat Dam no longer exhibit storm event peaks in the winter months. When considering minimum daily discharge (e.g., the minimum discharge on any given day between 1954 and 1990) from Pine Flat Reservoir, the greatest amount of water is released between June and August; this is a shift from the pre-dam condition when minimum flows (e.g., daily minimum between 1900 and 1947) were highest in April/May.

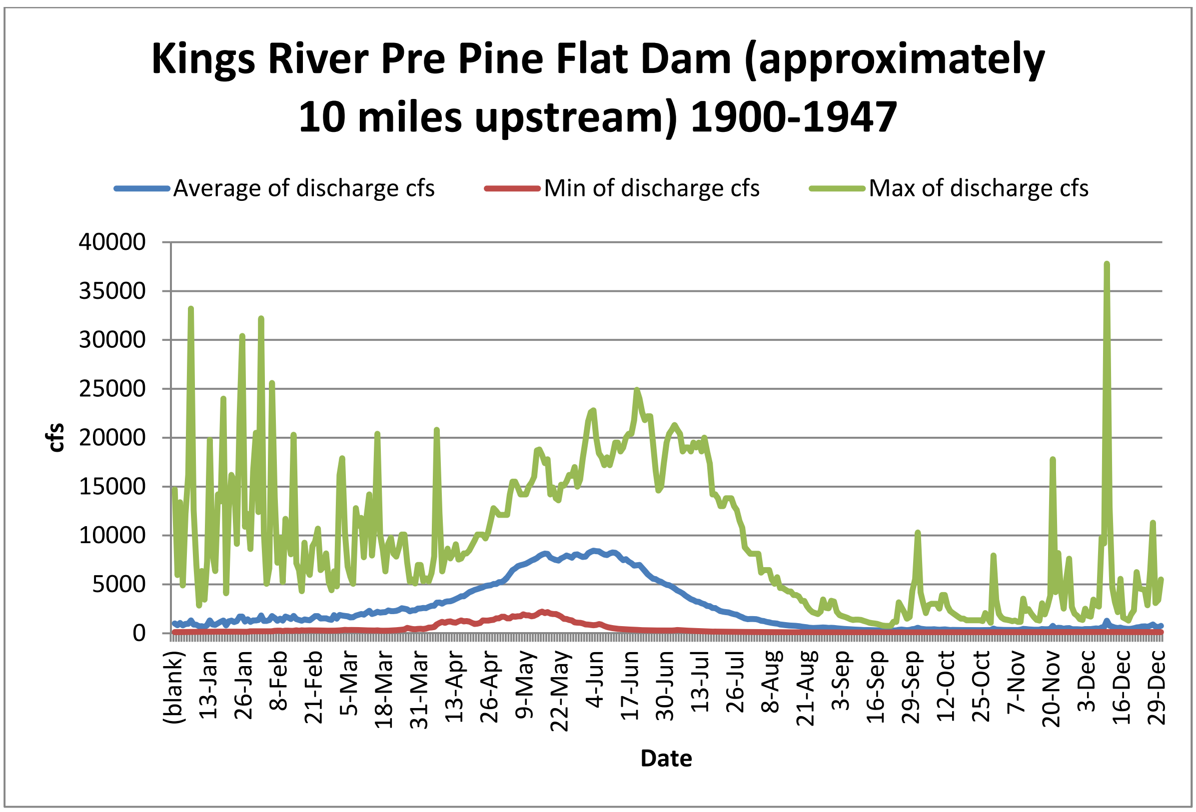


Figure 4
Discharge (cfs) of Kings River 10 miles upstream of Peck Island before construction of Pine Flat Dam, 1900-1947

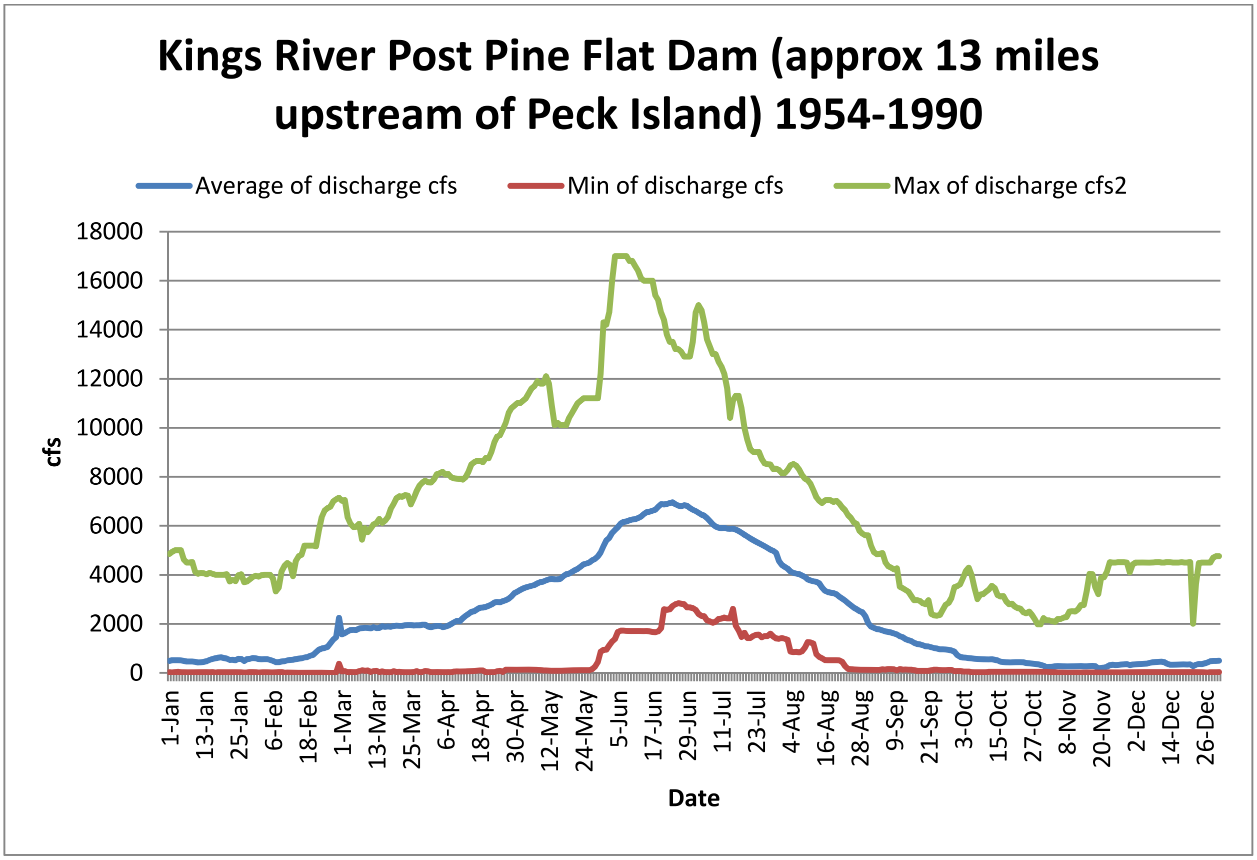


Figure 5
Discharge (cfs) of Kings River approximately 13 miles upstream of Peck Island after the construction of Pine Flat Dam, 1954-1990

The alluvial fan of the Kings River begins about 6 miles upstream, near Avocado Lake. At this point, some stream flow is diverted into canals while other portions spread out into numerous smaller channels. The braid of the Kings River that borders the northern side of the Peck Island property is the dominant channel in the area; however, the channel is smaller and the volume of water conveyed here is much less than that of the Kings River upstream before the start of the alluvial fan. Based solely on USGS maps and aerial images it is assumed that only a half to a third of the flows shown in Figure 5 reach the property. For example, during June when snow runoff is reaching its peak, the assumed maximum flow in the Kings River at Peck Island is between 8,000 cfs and 5,000 cfs. For the same month the assumed average Kings River flow at Peck Island is between 3,500 cfs and 1,000 cfs.

In addition to hydrology data from the Water Science Center, a USGS 7.5 quadrangle map from 1924 was reviewed to determine the presence of historical channels or wetlands within the Peck Island property. One historical intermittent stream was identified within the northern portion of the site that previously connected two river channels.

Geology/Soils

The geology of the Peck Island property is mapped broadly with much of the Central Valley shown as unconsolidated and semi-consolidated alluvium, lake, playa, and terrace deposits from the Quaternary Period (CDC 2010).

The NRCS web soil survey was reviewed to assess the soils present at the site (NRCS 2012a). Soils in the area are primarily mapped as the Grangeville series, consisting of fine sandy loam. The area currently used for agriculture is mapped as Grangeville fine sandy loam, which is described as a somewhat poorly drained soil, with high water transmission capacity (Ksat). Depth to the water table is estimated to be 48 to 72 inches with no restrictive layer identified in the top 80 inches. Grangeville soils are typically saturated within 40 inches of the surface for some portion of the year. This soil is typical of alluvial fans and flood plains. In the riparian area surrounding the agricultural fields, soils are primarily of the Tujunda series consisting of cobbly loamy sand. This series is also associated with flood plains and alluvial fans. It is similar to the Grangeville series, but is more excessively drained, has higher water transmitting capacity, and contains a portion of cobbles, stones, or boulders (NRCS 2012a).

Climate

The National Resource Conservation Service maintains a database of WETS tables displaying average precipitation and temperature data that can be used to assess the period of the growing season and whether a specific year has above- or below-average rainfall. These data are used in the delineation of wetlands. The closest WETS station is at the Pine Flats Dam, approximately 11 miles away; precipitation data from this station are presented in Table 1 (NRCS 2012b).

Since the WETS data only included 1971-2000, the Western Regional Climate Center data for Pine Flat Dam, which cover 1981 to 2010, were also considered. These two data sets were similar in their monthly and average precipitation values. The WETS data show an annual precipitation of 20.25 inches for the period from 1971-2000 and the climate center data show an annual rate of 20.76 inches from 1981-2010. However, a more significant difference was observed when comparing the Pine Flat Dam records with the Fresno WSO Airport records. The Fresno airport gauge is approximately 13 miles west of Peck Island while Pine Flat Dam is approximately 11 miles northeast of Peck Island. The Fresno airport receives only about half as much of the rainfall received at Pine Flat Dam (likely due to the orographic effect of the Sierra Nevada mountain range around and east of the dam). For this reason, precipitation at Peck Island is expected to be lower than the amount reported from the Pine Flat Dam.

Evapotranspiration for the site was estimated from the Reference Evapotranspiration Zone Map produced by the California Irrigation Management Information System (CIMIS 1999). Table 1 also shows the average monthly evapotranspiration rates for the Sanger area, Zone 12.

Table 1
WETS table for Pine Flat Dam Station, CA6896. Data record 1971-2000

Month	Average (inches)	30% of years have less than this amount (inches)	30% of years have more than this amount (inches)	Evapo-transpiration (inches)	Average Precipitation exceeds evapo-transpiration?
January	4.10	1.65	4.98	1.24	Yes
February	3.81	1.96	4.66	1.96	Yes
March	3.87	1.64	4.77	3.41	Yes
April	1.40	0.47	1.72	5.1	No
May	0.60	0.02	0.61	6.82	No
June	0.25	0.00	0.18	7.8	No
July	0.03	0.00	0.00	8.06	No
August	0.01	0.00	0.00	7.13	No
September	0.35	0.00	0.36	5.4	No
October	1.16	0.31	1.52	3.72	No
November	2.11	0.68	2.64	1.8	Yes
December	2.55	1.18	3.25	0.93	Yes
Annual	20.25	15.72	23.12	53.3	No

At Pine Flat Dam, average precipitation in the area exceeds average evapotranspiration from November through March (Table 1). At Fresno airport, average precipitation exceeds evapotranspiration December-February. In both cases, it is expected that the rainfall will suffice to support seasonal wetlands at Peck Island.

While there is little to no snowfall in the project site (NRCS 2012b), the area does receive snowmelt from the Sierra Nevada. USGS stream flow data (Figure 4, pre-dam) show that snowmelt typically contributes approximately 5,000 cfs to the Kings River at its peak in early June.

Annual temperature in Fresno (from station CA3257) averages about 76degrees Fahrenheit (°F) with lows in January and December of 54°F and highs in July of 97°F (NRCS 2012b). Temperature data were not available for the Pine Flat Dam Station, but the temperatures are presumed to be slightly lower due to the slightly higher elevation.

Reference Sites

Aerial imagery was reviewed to identify nearby areas immediately up- and downstream and paralleling the island that could serve as reference sites. There are several nearby locations where braids in the Kings River have developed. These areas show wide, dense riparian bands with scattered, more open woodlands. The specific plant species could not be determined from the aerial images and will need to be assessed in the field to determine the specific planting palate recommended for restoration. In addition, the stream morphology of potential reference sites will need to be assessed to determine whether conditions are similar to those observed at Peck Island.

In addition, intact vegetation along the edges of Peck Island may also serve as an appropriate reference. If possible, soil, topography, vegetation, and hydrology at an appropriate reference site should be assessed before engineering design begins.

Conceptual Restoration

The conceptual restoration design would restore, enhance, establish, and preserve wetlands and native vegetation communities to approximate the historical landscape based on nearby reference sites. During the development of this conceptual restoration design, parcel boundaries were found in some cases to be inconsistent with the river channel upon which they were originally mapped. To synchronize this analysis and acreage estimates, the mitigation areas and acreages were identified and defined following Peck Island's prevailing landscape features, like the centerline of the Kings River main stem (the island's northern boundary) and the Kings River channel to the south (the island's southern boundary), where restoration activities are expected to take place. Elsewhere, where sufficient data were available, conventional APN boundaries and fence lines were used, such as along the island's downstream western boundary that separates the Peck Island property from the remaining quarter of the island.

The conceptual restoration design proposes reestablishing a high-flow channel braid across a portion of the northern end of the property where a historic channel braid was mapped, and establishing two new high flow braids, one to the south and one across the center of the property (Figure 6). These channels will flow during larger runoff events equivalent to a bankfull flow (recurrence interval typically of 1.1 to 1.8 years) or higher. Along these channels, riparian vegetation will be established or reestablished and the existing riparian corridors will be widened (enhanced). On higher ground, outside the limits of the riparian corridor, oak woodlands will be reestablished. Several small seasonal wetlands, in the form of backwater pools, high flow channels, or isolated depressions, will also be created throughout the property.

Review of site hydrology, soils, existing vegetation, and topography provide the basis for the conceptual design. The following observations provide support for the conclusion that the site can support riparian and woodland vegetation.

- Nearby riparian areas supporting vegetation and hydrology similar to the proposed plan.
- Grangeville soils, which typically are associated with high water tables.
- Porosity of soils that allow phreatic groundwater flow between the two river channels surrounding Peck Island. No lithologic barriers were identified between the two channels, so the phreatic surface (water table) is expected to connect the water surface elevations in the two channels.
- Average precipitation in the area exceeds average evapotranspiration from November through March.
- Late spring/summer months contribute significant flows to the site in the form of dam release contributions.

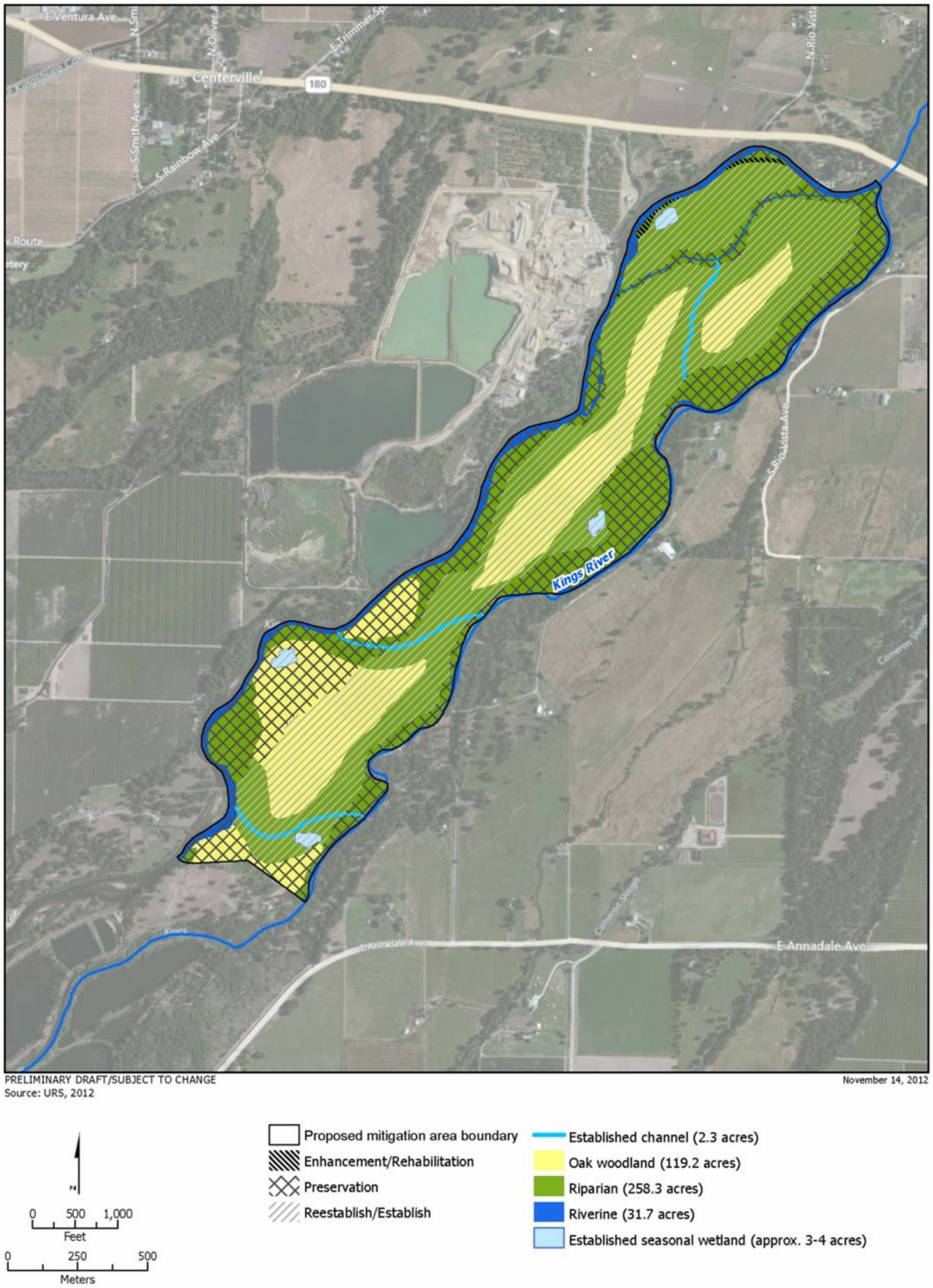


Figure 6
Conceptual restoration map: Peck Island property

The establishment/reestablishment of riparian vegetation will consist of planting riparian tree and shrub species in areas where hydrology is appropriate to support their growth. Riparian species found along the

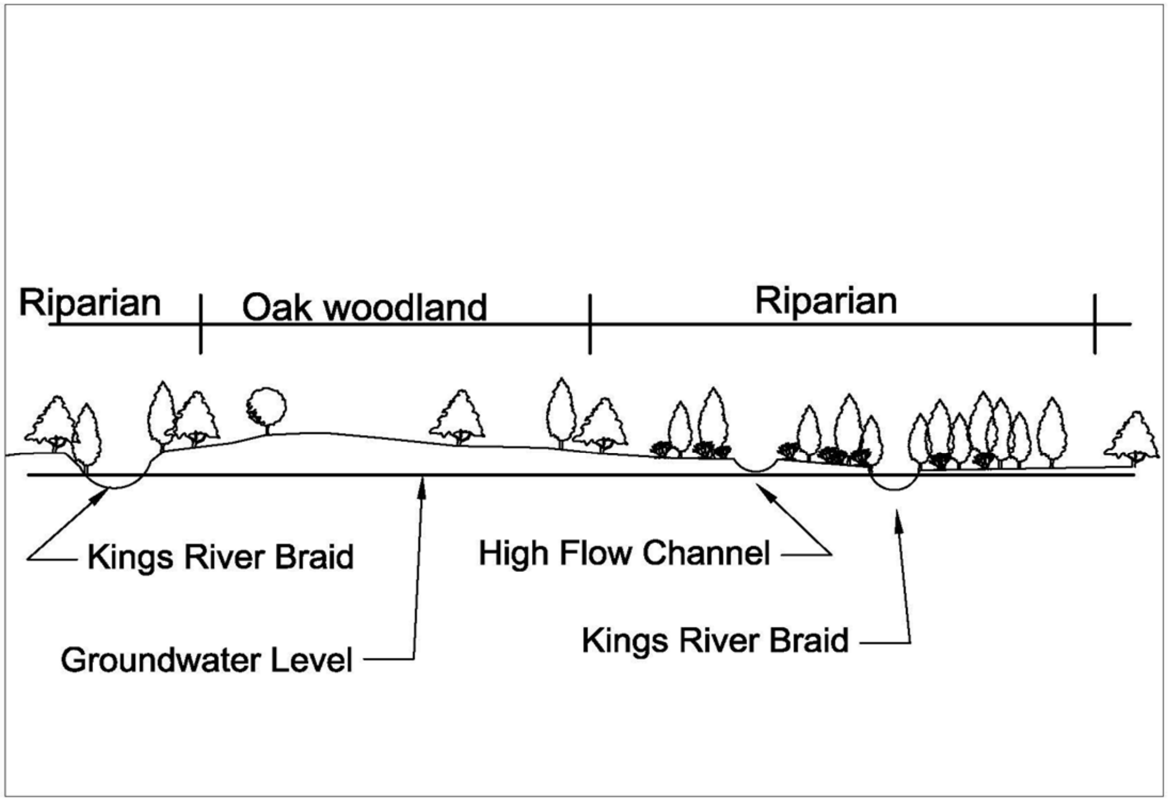
Kings River that may be appropriate for planting at this site include box elder (*Acer negundo*), Fremont cottonwood (*Populus fremontii*), elderberry (*Sambucus nigra*) and willow species (*Salix* spp.). The species palate will be refined based on a survey of nearby reference sites, and source material will be collected from within the Kings River watershed. In a few areas where native riparian vegetation already exists in a degraded state, the community will be enhanced through supplemental planting. Areas where native riparian vegetation is currently intact will be preserved.

Small remnant patches of valley oak woodland exist on higher ground in the interior of the island. The remaining agricultural land will be converted to oak woodland where appropriate. The oak woodland will transition into the surrounding riparian habitat. The species palate will be determined after review of on-site and reference site species, but may include: valley oak (*Quercus lobata*), interior live oak (*Quercus wislizeni*) and blue oak (*Quercus douglasii*). Understory shrubs such as toyon (*Heteromeles arbutifolia*), California coffeeberry (*Frangula californica*), elderberry (*Sambucus nigra*) and California blackberry (*Rubus ursinus*) may also be planted as appropriate.

In addition, the conceptual restoration design includes construction of several seasonal wetlands such as backwater pools, high flow channels, or depressions. Example locations are shown on Figure 6; however, the exact sizes and locations of these seasonal wetlands will be determined upon further evaluation of the site topography and groundwater table. It is presumed that the high groundwater table will enable the seasonal wetlands to be constructed such that the hydrology is largely supplied by groundwater with some rainwater inputs and overtopping from the river and drainages. The seasonal wetlands may be constructed as high flow channels or backwater pools along the river, or as isolated depressions that will fill through river overbanking or rainwater. Due to the highly porous soils, it is not expected that rainwater will be retained in the ponds for long if the bottom of the pond is at a significantly higher elevation than the groundwater. Further investigation of groundwater levels may identify areas where, with the proper design elevation, seasonal wetlands could be created supported by rainwater and groundwater. Seasonal wetlands will be created near the river channels and are estimated to cover from 0.1 to 1 acre each for a total of approximately 3 to 4 acres. The wetlands will be graded so as to provide the appropriate site hydrology and then planted with appropriate native wetland species such as rushes (*Juncus* spp.) and sedges (*Carex* spp., *Cyperus* spp.)

Riverine rehabilitation/enhancement will be provided in areas where the degraded riparian corridor is being rehabilitated/enhanced. In these areas, the increased shading and habitat diversity provided by the restored riparian vegetation will increase aquatic functions of the riverine system. Elsewhere on the property where riparian cover is already intact, riverine habitat will be preserved through the conservation easement restrictions.

Figure 7 shows an example profile of the conceptual restoration design through an area proposed for riparian and oak woodland habitat reestablishment. Wetland creation is not specifically shown in this profile, but is proposed in suitable areas throughout the site; wetlands may develop in high flow channels or in created depressions. Table 2 lists the proposed restoration potentially available on the site with the current conceptual design. The acreage and linear feet estimates are subject to change based on the results of further field investigations.



NOTES:
1. PROFILE IS CONCEPTUAL AND PROVIDED TO FOR VISUALIZATION OF POTENTIAL FUTURE CONDITIONS
2. DRAWING NOT TO SCALE
3. FEATURES SUCH AS GROUNDWATER LEVEL AND EXISTING TOPOGRAPHY NEED TO BE VERIFIED THROUGH FIELD EVALUATION.

DRAFT--FOR CONCEPTUAL USE ONLY

Peck Island Example Cross Section
HST FB

Figure 7

Figure 7
Peck Island property example cross section

Table 2
Conceptual Restoration Design Area

Resource Type	Acre(s)/Linear Feet	Average CRAM Score	Mitigation Category
Seasonal Wetland	4 acres	N/A	Establishment
Riparian	100 acres	N/A	Preservation
	1.5 acres	N/A	Rehabilitate/enhancement
	157 acres	N/A	Reestablish/Establish
Oak Woodland	35.0 acres	N/A	Preservation
	83.3 acres	N/A	Reestablish/Establish
Riverine	31.7 acres	N/A	Preservation
	29,330 linear feet	N/A	Preservation
	2.3 acres	N/A	Reestablish/Establish
	5,000 linear feet	N/A	Reestablish/Establish

Next Steps

- Conduct wetland delineation to map the boundaries of existing wetland, riparian, and riverine features.
- Conduct CRAM analysis of the site to assess current conditions of onsite riparian habitat.
- Evaluate current vegetation on the site, making a species list for plants that occur that will be suitable to propagate as part of the restoration design.
- Evaluate vegetation, hydrology, and soils within the project area and at a nearby reference site if feasible.
- Obtain project and reference site topography data either from a site survey or LiDAR.
- Collect fluvial-geomorphological data such as cross sections, profiles, and sediment data from within and adjacent to the project area and a reference area to assess the river stability and channel morphology. Data will ensure an adequate and responsible design.
- Install piezometers within the project area to determine the water table depth and seasonal fluctuations.
- Review preliminary title report and identify if any encumbrances are present that could limit the potential for the use of this site.
- Conduct a Phase I environmental site assessment to evaluate any potential for site contamination resulting from prior land management.

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C8.0 Panorama Vista Preserve Properties

The Panorama Vista Preserve properties were identified as a candidate mitigation property as part of a mitigation site selection analysis. In response to a Permission-to-Enter mailing initiated in November 2011, Panorama Vista Preserve manager Carolyn Belli responded, granting permission for the Authority's consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable biological mitigation resources onsite. After the initial reconnaissance-level surveys had been performed, in January 2012, the preserve manager Carolyn Belli and the preserve's consultant, Julie Rentner of River Partners, were contacted to confirm their interest in pursuing compensatory mitigation with the Authority at this location, a conversation that was resumed in June 2012. In response to Belli and Rentner's interest and favorable input from Zach Simmons at the U.S. Army Corps of Engineers about pursuing wetland restoration, enhancement, and establishment and other mitigation opportunities within the Preserve, a draft conceptual analysis of wetland restoration and establishment potential was performed in September 2012. In October 2012, title reports were requested for the APNs under investigation. The Authority and its regional consultants have continued to work with the Panorama Vista Preserve through the coordination of conceptual wetland design onsite.

The Panorama Vista Preserve properties consists of 60 adjacent assessor parcel numbers (APNs) in Kern County owned by The Kern River Corridor Endowment and Holding Company, Inc. The 60 parcels total 1,044 acres on either side of the Kern River, north (upstream) of the City of Bakersfield, and include a combination of natural and disturbed lands composed of non-native annual grasslands, disturbed lands, willow and saltbrush scrub, and cottonwood riparian forest. The southern portion of the preserve encompasses the steep, sandstone formations known as the Panorama Bluffs, which host a remnant population of the federally endangered Bakersfield cactus (*Opuntia treleasei*). The Preserve straddles the city limits of northeastern Bakersfield and unincorporated lands of northern Kern County, stretching from near Manor Drive in the east to China Grade Loop in the west. The northern boundary of the Preserve roughly follows the Beardsley Canal alignment. The Panorama Bluffs and Panorama Park provide the southern boundary. The rolling hills immediately north of the Preserve host the Kern River Oilfield, an approximately 10,750-acre active oil field with densely placed oil derricks and sparse annual vegetation that is anecdotally used by San Joaquin kit fox as foraging habitat and a migratory corridor.

Together with portions of the natural land within the Kern River Oilfield and the Sierra Foothills, the Panorama Vista Preserve properties and the surrounding natural lands provide approximately 9,000 acres of contiguous open space between Bakersfield and the Sierra Foothills suitable for special-status wildlife species. The preservation and potential restoration, enhancement, and establishment of the aquatic resources onsite and associated habitats would augment and buffer the hydrologic values of these lands from a local to an HUC-8 watershed level.

C8.1 Wetland Resources

C8.1.1 Reconnaissance Surveys

The Panorama Vista Preserve is within the Middle-Kern Upper-Tehachapi Grapevine HUC-8 watershed. RC biologists conducted a brief site visit to five of the parcels on December 27, 2012. They documented general site conditions, distributions of habitats, and the conditions of the Kern River riparian corridor (see photo, left).

In addition to the Kern River main channel, the Beardsley Canal and the Kern Island Canal run through the property (Figure 2). The canals divert water from the Kern River just upstream of the Panorama Vista Preserve. Other aquatic features on the Panorama Vista Preserve include two freshwater ponds (one shown below) and riverine habitats. Some of the riparian areas are buffered by mature riparian forest.

The soils in the area are characterized as sandy and well-draining. Seasonal wetland establishment may be an option if a clay liner is imported to create a more impermeable barrier.

C8.1.2 Environmental Stressors

The stressors identified during the reconnaissance survey include nearby land uses – there are point sources of pollutants, including feedlots. The Preserve is bounded by oil fields to the north and urban areas to the south. Both the Beardsley and Kern Island Canal are bermed and there are other pumps, levees, and culverts that convey and move water. Roads and nearby land uses may contribute sediment to the natural water bodies.

Wetland biologists will conduct a more detailed assessment of environmental stressors during a California Rapid Assessment Method (CRAM) survey. If mitigation planning moves forward, RC biologists may conduct these standardized surveys during the spring season or as wetland conditions permit.

C8.2 Wildlife Assessment

C8.2.1 Reconnaissance Surveys

RC biologists conducted a brief site visit on December 27, 2011, to determine habitats and confirm site conditions. The primary vegetation communities observed on the Panorama Vista Preserve include extensive riparian forests and scrub. There are upland annual grasslands and regions of elderberry savanna. While some areas are better described as ruderal, the revegetation efforts in disturbed areas were apparent. These parcels are within the Kern River Corridor, and compose a part of the San Joaquin kit fox satellite habitat.

Species observed during the site visit included great egret (*Ardea alba*), bufflehead (*Bucephala albeola*), red-tailed hawks (*Buteo jamaicensis*), and California ground squirrels (*Otospermophilus beecheyi*).

The natural vegetation communities present onsite provide habitat suitable for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), blunt-nosed leopard lizard (*Gambelia sila*),

western burrowing owl (*Athene cunicularia*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and San Joaquin kit fox (*Vulpes macrotis mutica*). These species have been reported in the vicinity, and have been reported or have the potential to be present on the properties.

C8.2.2 Desktop Review

RC GIS specialists conducted a CNDDB query at a 5-mile buffer for the species requiring mitigation (Figure 1).

Valley elderberry longhorn beetle has been documented onsite at the eastern end of the Preserve (Figure 3). Suitable habitat for the beetle is present onsite; the species requires large elderberry shrubs (*Sambucus* sp.) for reproduction.

The closest reported blunt-nosed leopard lizard observations are 2 miles east of the property (in 2004) and 3.8 miles east (in 1989). The annual grasslands and saltbrush scrub on the property provide suitable habitat for this species.

The closest reported western burrowing owl observations are 3.5 to 4 miles northwest of the property (in 2002). The annual grasslands and saltbrush scrub on the property provide suitable habitat for this species.

The closest reported Nelson's antelope squirrel observation was approximately 4 miles east of the property (in 1911). The annual grasslands and saltbrush scrub on the property provide suitable habitat for this species.

The closest reported Tipton's kangaroo rat observations were approximately 4 miles east of the property (in 1911) and 8 miles west of the property (in 1990). The annual grasslands and saltbrush scrub on the property provide suitable habitat for this species.

There are multiple San Joaquin kit fox records with a 5-mile radius of the Panorama Vista Preserve. The closest of these observations was reported less than ¼ mile west of the property (in 2006). The annual grasslands and saltbrush scrub on the property provide suitable habitat for this species.

C8.3 Conceptual Restoration

C8.3.1 Reconnaissance Surveys

Restoration at the Panorama Vista Preserve has been detailed under their existing 2009 *Conceptual Restoration Plan for the Panorama Vista Preserve, Bakersfield, Kern County, California* (River Partners 2009). Under the existing plan, the preserve has been divided into five different locations for which restoration design has been phased. Restoration is currently underway for project Phase 1 (nearing completion) and Phase 2 (expected 3 to 5 years to completion), and in development for project Phases 3, 4, and 5. These later phases are currently open to design input and funding opportunities. The scope of the proposed funding opportunities and conceptual restoration design on the site described here is limited to Phase 3 (approximately 151 acres) and Phase 4 (approximately 132 acres), where existing site conditions would benefit from site restoration. Phase 5 lands were not considering in this analysis because they lack suitable habitats and the restoration potential may be limited because of the current active mineral extraction underway at these locations.

The conceptual restoration design proposes reestablishing native vegetation that approximates the historical landscape and nearby reference site vegetation communities. The conceptual plan

proposes reestablishing native riparian vegetation along the Kern River and valley saltbush scrub in upland areas beyond the riparian corridor. Additionally, native elderberry savanna, which is present in some of the transition areas between the upland scrub and the riparian scrub, will be reestablished or rehabilitated. If feasible, backwater channels or high-flow channels may be established that provide areas for water collection during periods of high water. It may also be feasible to establish small seasonal wetlands in off-channel depressions that are supported by rainfall and high groundwater. The feasibility of side channel or depressional wetland establishment will be determined after additional topographic and groundwater level assessment.

In addition to the establishment/reestablishment of riparian vegetation and seasonal wetlands, existing, intact riparian and riverine habitat will be preserved through the implementation of a conservation easement on the site. Degraded riparian areas will be rehabilitated through supplemental plantings and weed control.

The establishment/reestablishment of riparian vegetation would consist of planting riparian tree and shrub species in areas where hydrology is appropriate to support their growth. The species palate would be based on a survey of nearby reference sites, and source material would be collected from within the Kern River watershed. Riparian species found along the Kern River that may be appropriate for planting at this site include Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*) elderberry (*Sambucus nigra*) and willow species (e.g., *Salix* spp.). The species palate would be defined based on a survey of nearby reference sites, and source material would be collected from within the Kern River watershed. In a few areas where native riparian vegetation already exists but is degraded, the community will be enhanced through supplemental planting. Areas where native riparian vegetation is currently intact will be preserved.

Riverine rehabilitation/enhancement would be provided in areas where the degraded riparian corridor is being rehabilitated/enhanced. In these areas, the increased shading and habitat diversity provided by the restored riparian vegetation will increase aquatic functions of the riverine system. Elsewhere on the property where riparian cover is already intact, riverine habitat will be preserved through conservation easement restrictions.

The exact acreages and locations of additional backwater seasonal wetland and future site restoration, enhancement, or reestablishment elsewhere in the preserve will be developed in more detail upon further evaluation of the site topography and groundwater table and through close collaboration with the Panorama Vista Preserve. Feedback from preserve staff indicates that the preliminary conceptual restoration designs proposed to date are consistent with the goals and objectives of the preserve.

C8.4 Next Steps

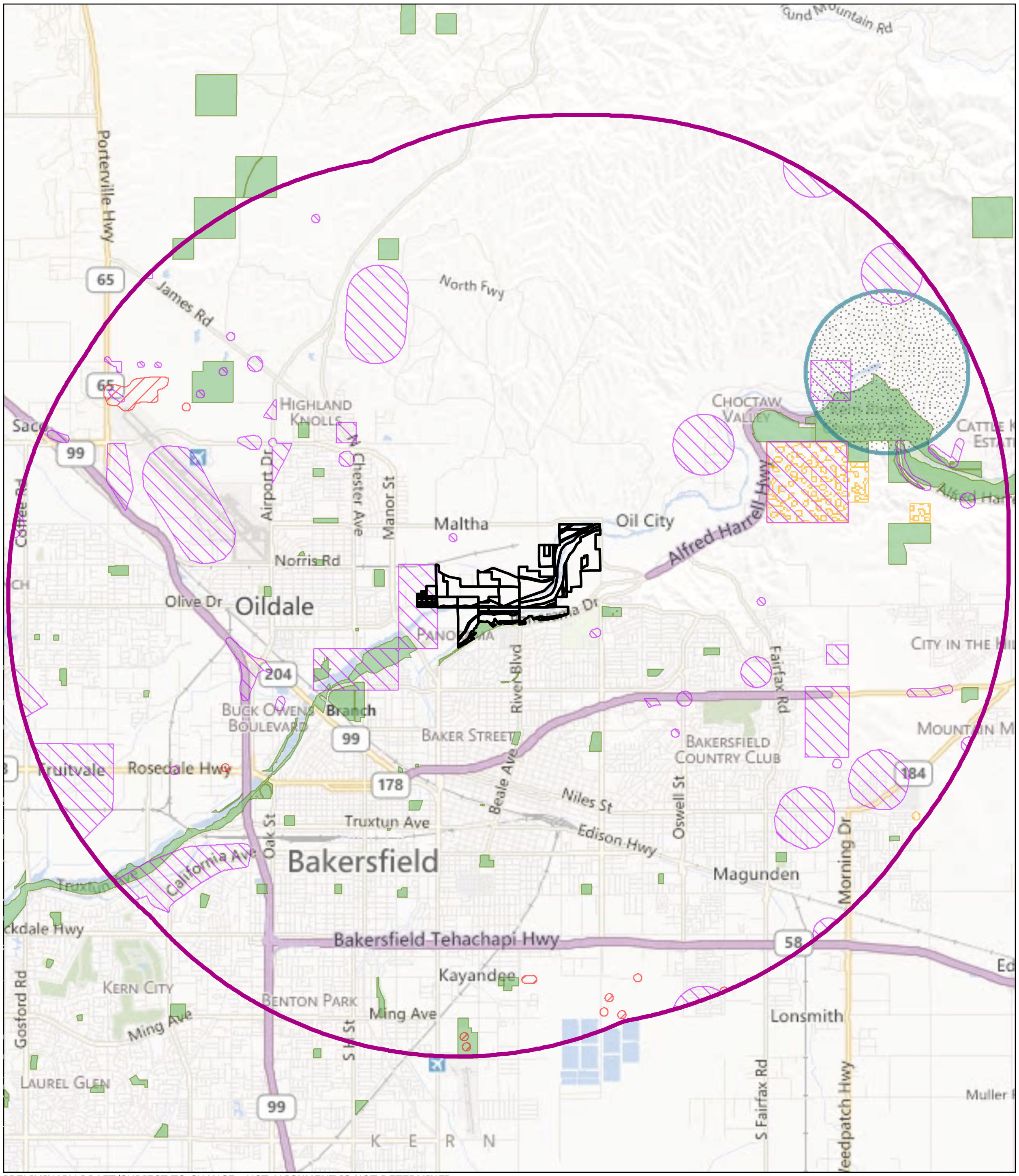
Aquatic and upland habitats on the properties provide suitable opportunities for restoration, enhancement, reestablishment, and preservation. Future efforts should include a site visit to conduct CRAM surveys and collection of data to refine the placement and design of any wetland creation efforts. If needed, more detailed topography and bathymetry information may be useful. Better estimates of water inputs to the Kern River through the Preserve will be instrumental in determining whether wetland creation efforts will be successful. Plant surveys and more detailed habitat mapping will be informative to creating revegetation plans.

If the Panorama Vista Preserve is suitable for wildlife mitigation, RC biologists will need to document or update occurrence records for special-status species. If this is the case, more recent and focused wildlife surveys for special-status species are also advised. These may include visual encounter or transect surveys for blunt-nosed leopard lizards and Nelson's antelope squirrels;

small-mammal trapping for Tipton kangaroo rats; and nighttime spotlighting, transect surveys, or camera trapping for San Joaquin kit foxes.

Future coordination with agency personnel will be critical in the development of a conservation easement on the property and to help identify what additional steps are necessary to attain agency approval to partially or fully mitigate existing impacts on biological resources.

Panorama Vista Preserve (1,044 acres)	
Resource Type	**Acreage Available**
Uplands	
Riparian	33.5 ac preservation
	118.2 ac rehabilitation/enhancement
	45.5 ac reestablishment
Wetlands	
Riverine	17.4 ac preservation
Wildlife	
blunt-nosed leopard lizard	1,044 ac
western burrowing owl	1,044 ac
Nelson’s antelope squirrel	1,044 ac
Tipton kangaroo rat	1,044 ac
San Joaquin kit fox	1,044 ac
ac = acres N/A = not applicable	



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

December 6, 2012

Source: Bing Imagery maps, CNDDB 2012

Special-status species

- Blunt-nosed leopard lizard
- Burrowing owl
- Nelson's antelope squirrel
- San Joaquin kit fox
- Tipton kangaroo rat

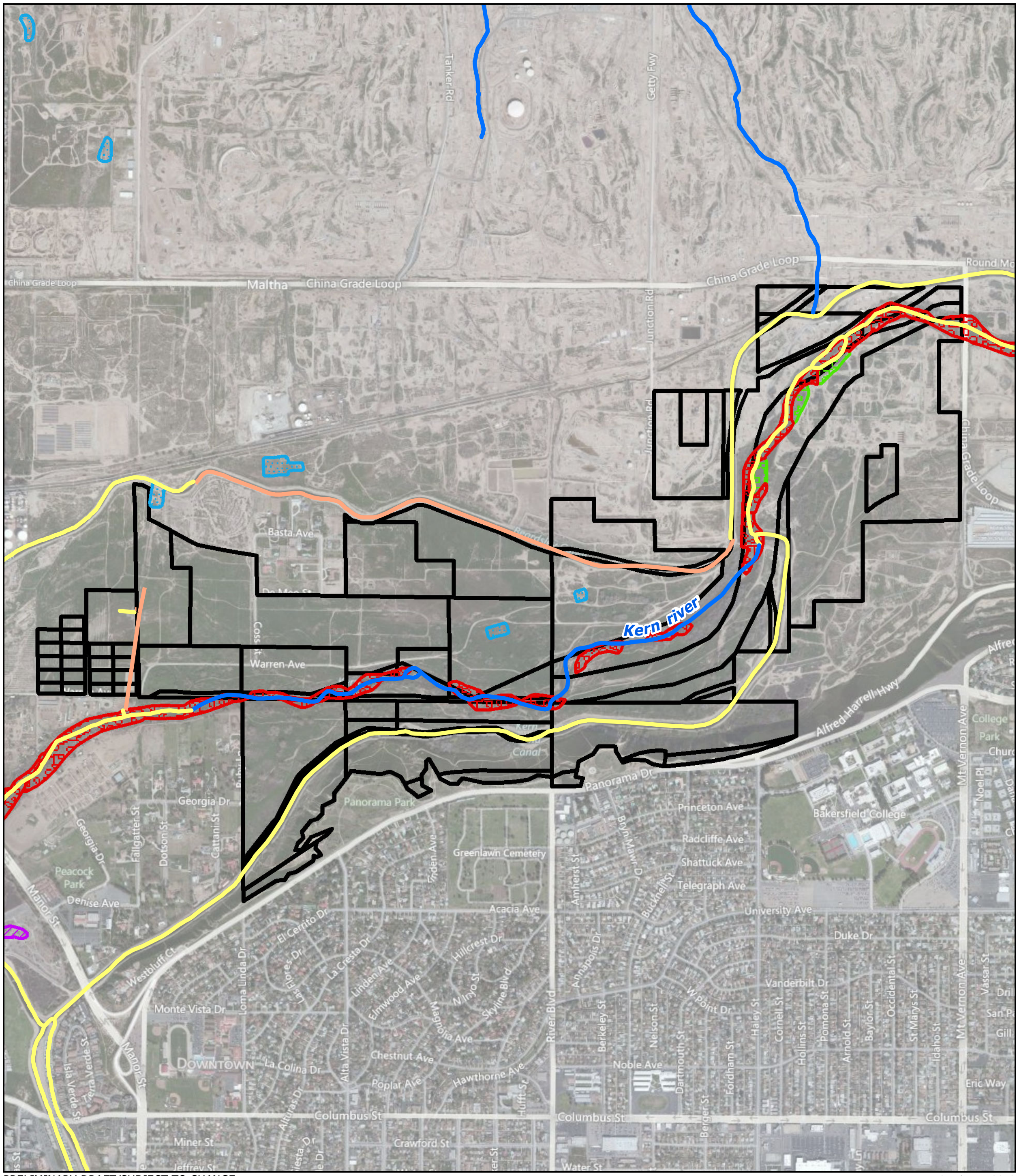
- Parcel boundary
- 5-mile buffer
- Public lands

N

0 1 2
Miles

0 2 4
Kilometers

Figure 1
CNDDB occurences and critical habitat
Panorama Vista Preserve properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012, U.S.,NWI data is from Fish and Wildlife Service 2012 & NHD data is from USGS.

October 4, 2012

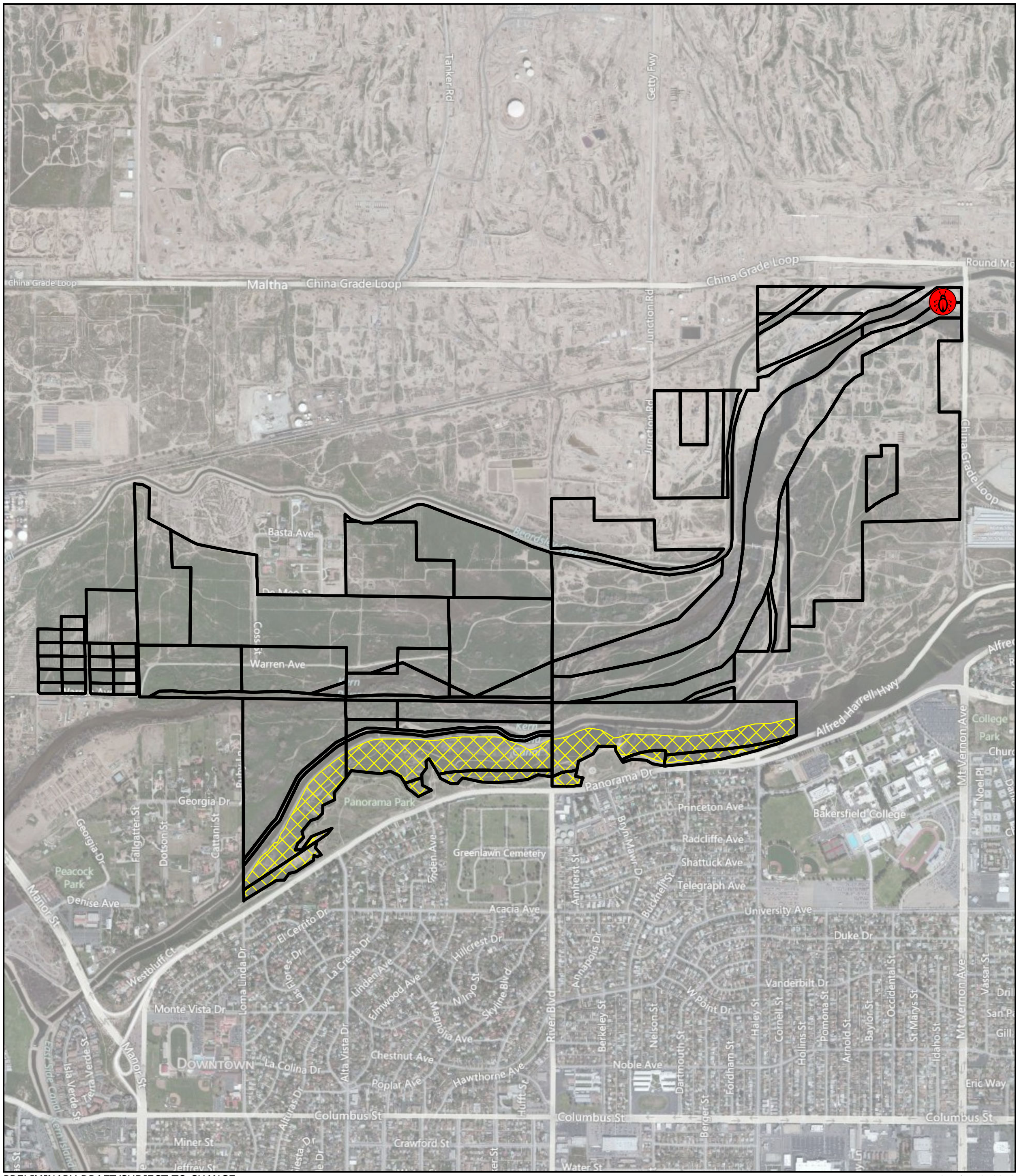
- Artificial path
- Canal/Ditch
- Stream/River
- Freshwater emergent wetland
- Freshwater forested/Shrub wetland
- Freshwater pond
- Riverine
- Parcel boundary

N

0 1,000 2,000
Feet

0 500 1,000
Meters

Figure 2
Wetland survey map
Panorama Vista Preserve properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE

Source: URS, 2012 & CNDDB 2012

October 8, 2012

CNDDB species records

Valley elderberry longhorn beetle

Bakersfield cactus (Panorama Bluffs)

Parcel boundary

N

0 1,000 2,000

Feet

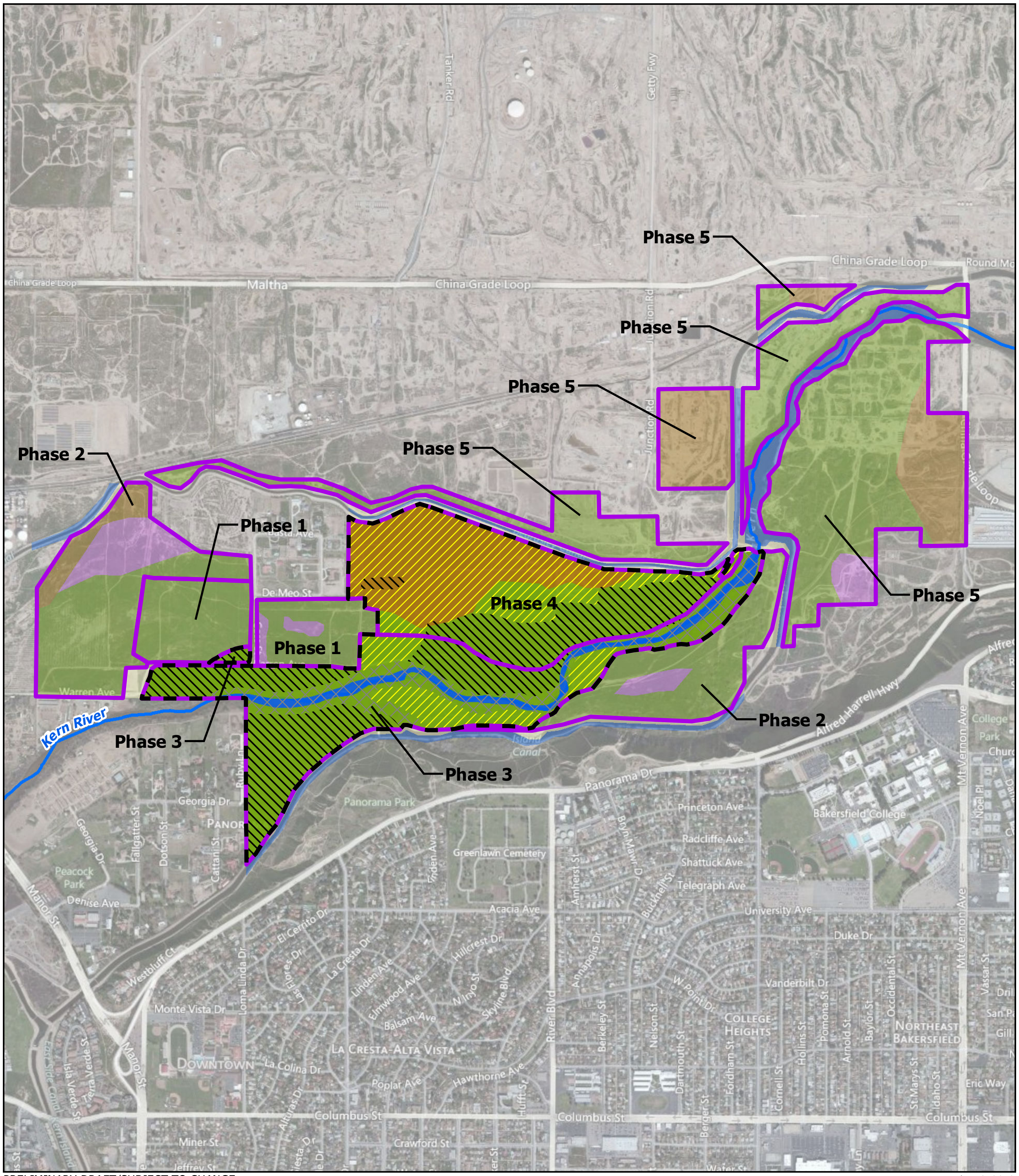
0 500 1,000

Meters

Figure 3

Special-status species survey results

Panorama Vista Preserve properties



PRELIMINARY DRAFT/SUBJECT TO CHANGE
Source: URS, 2012

December 6, 2012

0 500 1,000
Feet

0 250 500
Meters

- Proposed mitigation area boundary
- Project phase
- Enhancement/Rehabilitation
- Preservation
- Reestablish/Establish

Acres within proposed mitigation area

- Riparian (197.2 acres)
- Elderberry savanna (0.1 acres)
- Riverine (17.4 acres)
- Valley saltbush scrub (68.7 acres)
- Non-native grassland (0.4 acres)

Figure 4
Conceptual restoration map
Panorama Vista Preserve properties

URS/HMM/Arup Joint Venture
2870 Gateway Oaks Drive, Suite 150
Sacramento, CA 95833
Tel: (916) 679-2000
Fax: (916) 679-2900

Memorandum

To: Lupe Jimenez, California High-Speed Rail Authority
Mark McLoughlin, California High-Speed Rail Authority

From: Matthew Bettelheim, URS Corporation
Katherine Dudney, URS Corporation

Date: December 10, 2012

Subject: Analysis of Mitigation Potential at Panorama Vista Preserve

The Panorama Vista Preserve property was identified in a mitigation site selection analysis as a potential mitigation site. In response to a Permission-to-Enter mailing begun in November 2011, Panorama Vista Preserve Manager Carolyn Belli granted permission for the California High-Speed Rail Authority's (Authority's) consultants to access and conduct reconnaissance and protocol-level surveys to identify and map suitable biological mitigation resources on the site. After the initial reconnaissance-level surveys had been performed in January 2012, Carolyn Belli, the Preserve Manager, and the Preserve's Consultant Julie Rentner of River Partners, were contacted to confirm their interest in pursuing compensatory mitigation with the Authority at this location, a conversation that was resumed in June 2012. In response to the interest shown by Belli and Rentner in pursuing wetland restoration, enhancement, and establishment, and other mitigation opportunities within the preserve, and to the favorable input from Zach Simmons of the U.S. Army Corps of Engineers (USACE), a draft conceptual analysis of wetland restoration and establishment potential was performed in September 2012. In October 2012, title reports were requested for the assessor's parcel numbers (APNs) under investigation. The Authority and its regional consultants have continued to work with the management of the Panorama Vista Preserve through the coordination of funding opportunities and in the conceptual restoration design of the site.

This revised memorandum provides background information about the Panorama Vista Preserve property and summarizes the results of the analysis conducted to determine their suitability for wetland mitigation and the feasibility of performing wetland restoration, enhancement, establishment, and preservation onsite to mitigate for aquatic impacts associated with the Fresno to Bakersfield Section of the proposed High-Speed Train (HST) System. Although the Kern River Corridor Endowment (the Endowment) currently holds the preserve in trust, the property may be suitable for mitigating impacts on special-status wildlife species and wetland impacts. To analyze potential mitigation opportunities on the site, restoration ecologists reviewed the existing Panorama Preserve Conceptual Restoration Plan (River Partners 2009), water rights literature, and hydrology data for the Kern River. This memo further describes these analyses and describes potential mitigation opportunities that are ecologically suitable for the site.

Environmental Setting

The Panorama Vista Preserve property consists of 60 adjacent APNs in Kern County, which are owned by the Kern River Corridor Endowment and Holding Company, Inc. (Figure 1). The 60 parcels total 1,044 acres on either side of the Kern River, north (upstream) of the city of Bakersfield, and include a combination of natural and disturbed lands composed of non-native annual grasslands, disturbed lands,

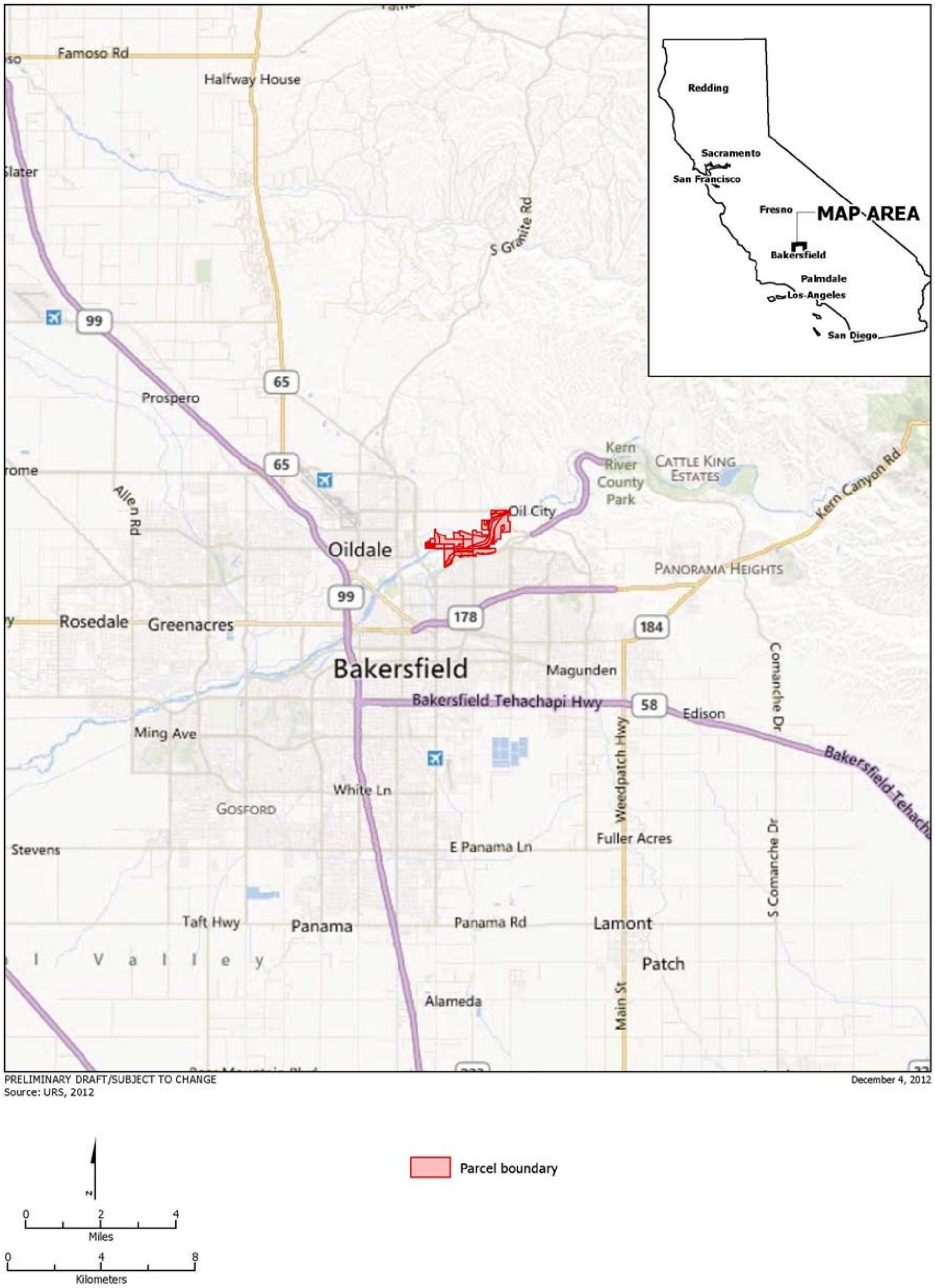


Figure 1
Vicinity Map: Panorama Vista Preserve Property

willow and saltbush scrub, and cottonwood riparian forest. The southern portion of the preserve encompasses the steep sandstone formations known as the Panorama Bluffs, which host a remnant population of federally endangered Bakersfield cactus (*Opuntia treleasei*). The preserve straddles the city limits of northeastern Bakersfield and unincorporated lands of northern Kern County. Only about 283 acres of the 1,044-acre preserve are currently under consideration as potential mitigation; the remaining acreage is either currently undergoing restoration or is not suitable for habitat restoration at this time.

Land Use

The preserve is bounded by oil fields to the north and urban areas to the south. The Kern River oilfield to the north is an approximately 10,750-acre active oil field with densely placed oil derricks and sparse annual vegetation. With the discovery of oil much of the land in the preserve and the surrounding area was cleared for excavation. Both cleared and forested areas were grazed by cattle, limiting the recruitment and regrowth of woody vegetation. Much of the surrounding land has also been cleared for agriculture (River Partners 2009). Two bermed canals used for irrigation of these agricultural lands, the Beardsley and Kern Island canals, divert water from the Kern River and transport it through the preserve. In addition, the preserve currently includes an active equestrian trail.

Vegetation

Six plant communities (Holland 1986) were identified on the site: Cottonwood-Sycamore Riparian Forest, Cottonwood-Willow Riparian Forest, Willow Scrub, Elderberry Savanna, Valley Saltbush Scrub, and Non-native Grassland (River Partners 2009). For the purposes of this report, Cottonwood-Sycamore Riparian Forest, Cottonwood-Willow Riparian Forest, Willow Scrub, and Elderberry Savanna are classified together as riparian habitat. Riverine habitat, consisting of the Kings River and the canals, was mapped using aerial imagery. Additional information regarding the existing vegetation communities and their representative species can be found in the Conceptual Restoration Plan (River Partners 2009).

Hydrology

Numerous upstream diversions complicate the water rights along the Kern River through Panorama Vista Preserve. The first water rights agreement was made in 1888, when prominent landowners in the area decided that one-third of the water in the Kern River, as measured at “first point,” just north of Panorama Vista Preserve, would belong to downstream property owners. The remaining two-thirds of the water could be diverted by upstream users. In 1900, Shaw’s decree (a judicial water rights decision) further defined specific diversion amounts for users along the river. Numerous canals and diversions are present along the Kern River, and these historical agreements still govern their use (City of Bakersfield 2003).

In 1953, Isabella Dam, which is owned and operated by USACE, was constructed on the Kern River approximately 40 miles upstream of the Panorama Vista Preserve. Diversions for two canals, the Beardsley Canal and the Kern Island (or Carrier) Canal, are just upstream of the preserve. The dam, along with the diversions into the upstream canals, has greatly altered the natural flow of the Kern River through the preserve. Generally, the diversions into the canals decrease the flow in the Kern River, and the dam alters the natural hydrography by reducing maximum flows during flood events and releasing water during the summer months (when it is needed for irrigation).

The U.S. Geological Survey and USACE maintain stream gage data (i.e., measurements of daily flow) at various points along the river. The nearest gage is upstream of the preserve (specifically, just upstream of the start of the Beardsley Canal). Daily data from this gage from 1954 (after dam construction) to

1976 (the end of the gage record) were used to estimate flows through the preserve. The City of Bakersfield also maintains a gage in the same area; the data record for this gage is 2008 to 2012. This data record was also used to estimate flows through the preserve. According to Shaw's decree, the Beardsley Canal may divert 370 cubic feet per second (cfs) from the Kern River, and the Kern Island (Carrier) Canal may divert 300 cfs from the Kern River (City of Bakersfield 2003). Because both of these diversions are upstream of the preserve, 670 cfs were subtracted from the available stream gage data to estimate the amount of flow through the preserve. The minimum, maximum, average, and median daily flow were all considered in determining whether the annual flows through the preserve would be sufficient to support wetland creation. The hydrographs from the stream flow data suggest that May and June have the highest flow through the preserve. The maximum daily estimated flows in May and June for the period 1954 to 1976 range from 5,000 to 7,000 cfs, and the minimum daily discharge is 0 cfs. The mean discharge during May and June is around 1,000 cfs (Figure 2). More recent data (from 2008 to 2012) indicate that the current discharges are similar to the historical discharges, with estimated flows ranging from 500 to 4,000 cfs during May and June (Figure 3).

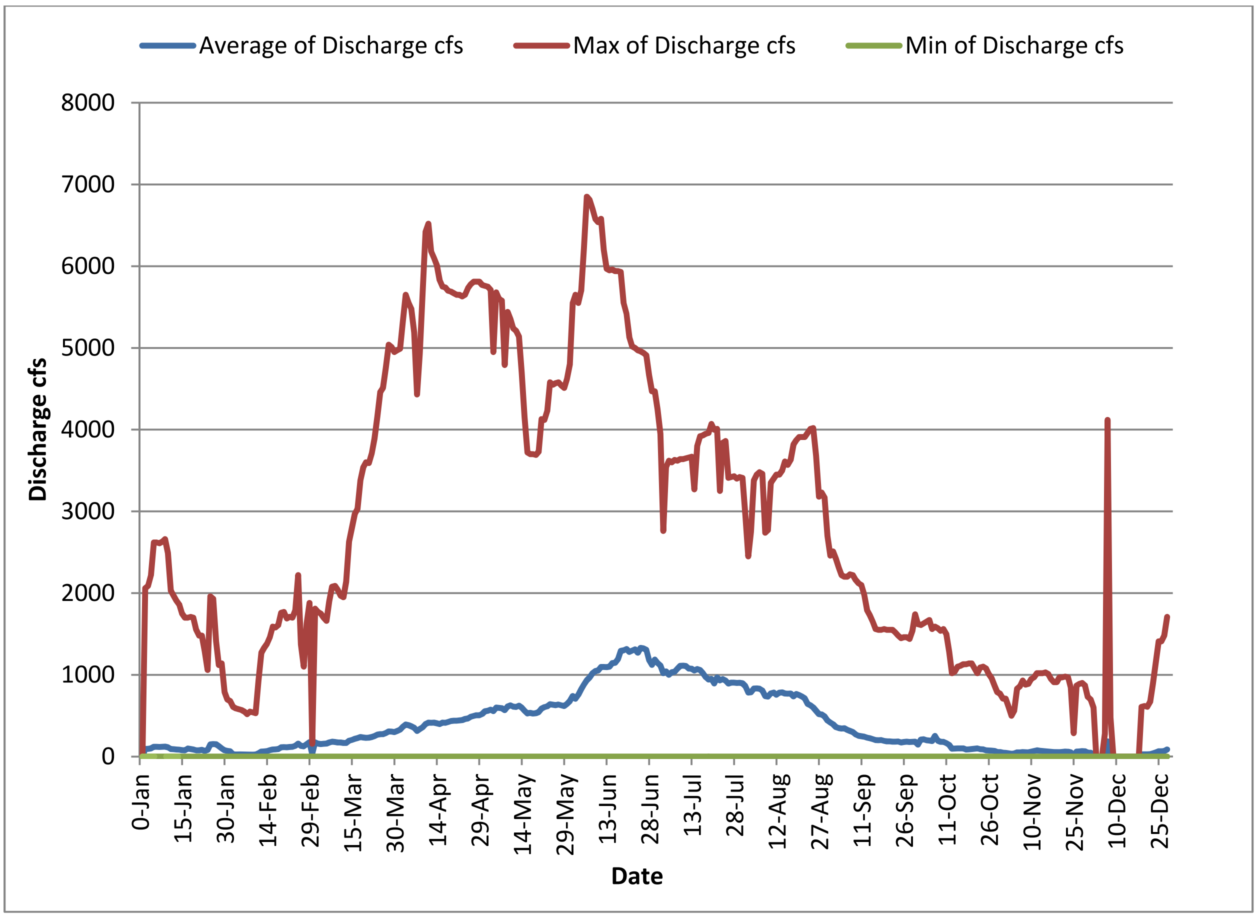


Figure 2
Daily minimum, average, and maximum estimated flow (cfs) through Panorama Vista Preserve based on daily data from 1954 to 1976

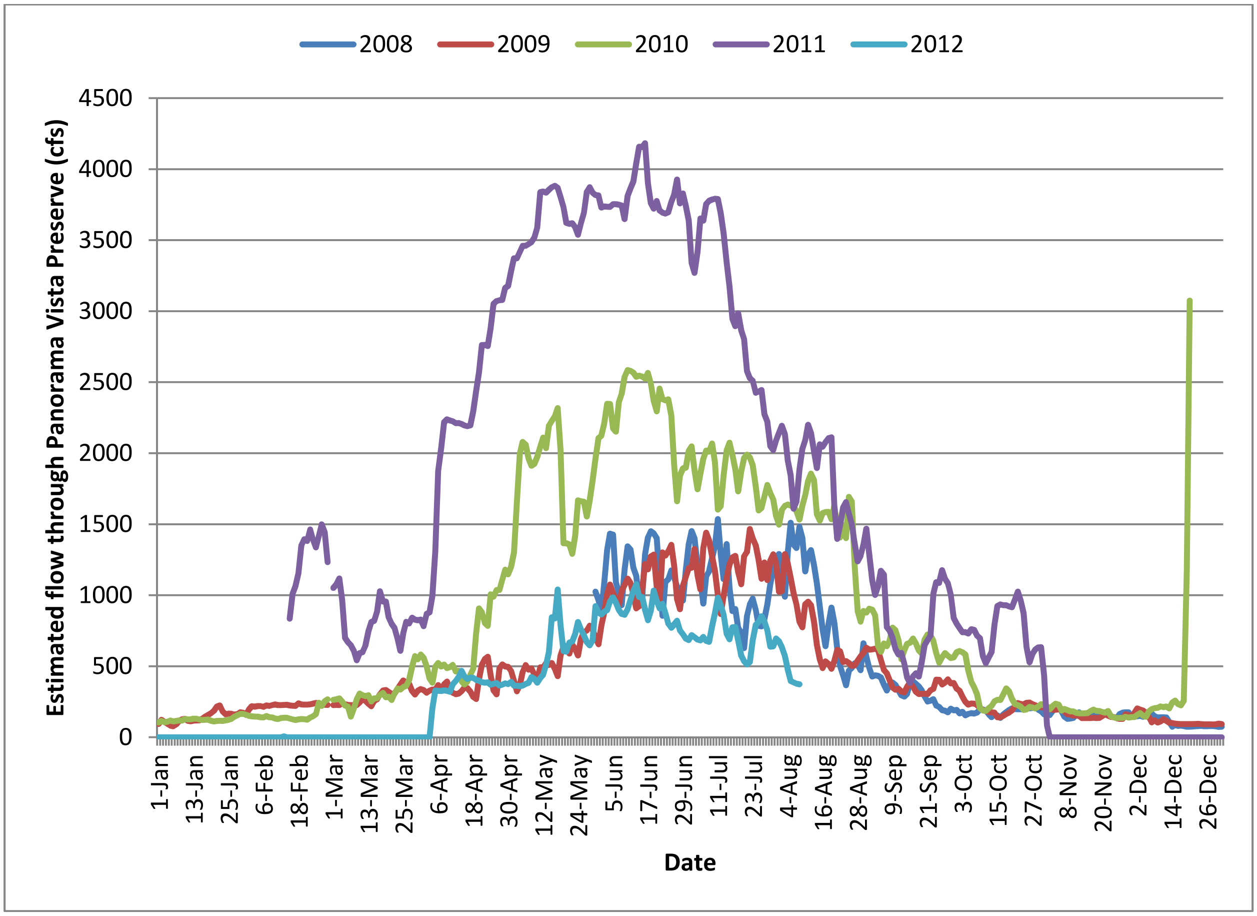


Figure 3
Estimated daily flow data (cfs) through Panorama Vista Preserve for 2008 to 2012

Soils

In May 2009, staff from River Partners dug nine soil pits throughout the preserve to assess soils. The Natural Resources Conservation Service are mapped the soils as primarily Excelsior variant silt loam and Hesperia sandy loam. Both of these soils are Torrifluvents that occur in well-drained soils and are typical of alluvial fans and floodplains. Permeability and available water capacity are moderate. While soil pits did not typically identify groundwater within the top 100 inches, indications of inundation were observed from between 4 to 70 inches below the surface. Most excavations showed roots extending 4 to 5 feet (River Partners 2009). Additional details regarding soils at Panorama Vista Preserve can be found in the Conceptual Restoration Plan (River Partners 2009).

Climate

The nearest weather stations to the Panorama Vista Preserve with a long data record are at the Bakersfield Airport, approximately 4 miles west. According to the Western Regional Climate Center (WRCC) data for station 040442, average temperatures range from approximately 57.4 °F in January to

98.6 °F in July (data record 1937–2012). Precipitation data from the Western Regional Climate Center (WRCC) for 1937 to 2012 approximate the WETS data provided in Table 1 for the period 1971-2000; the WRCC average annual precipitation is slightly less at 6.17 inches. Table 1 lists the WETS table values and the California Irrigation Management Information System (CIMIS) evapotranspiration rate values for the site. WETS precipitation data are from Bakersfield Airport, station CA0442. The evapotranspiration rate for the region is based on the CIMIS Reference Evapotranspiration Map (CIMIS 1999). In each month, evapotranspiration rates exceed precipitation rates (Table 1).

Table 1
WETS Table for Bakersfield Airport, CA0442 (1971–2000) and CIMIS Evapotranspiration Rates

Month	Average (inch[es])	30% have less than this amount (inch[es])	30% of years have more than this amount (inch[es])	Evapo-transpiration (inch[es])	Average precipitation exceeds evapo-transpiration?
January	1.18	0.50	1.46	1.24	No
February	1.21	0.49	1.46	2.24	No
March	1.41	0.75	1.74	3.72	No
April	0.45	0.13	0.60	5.70	No
May	0.24	0.00	0.24	7.44	No
June	0.11	0.00	0.06	8.10	No
July	0.00	0.00	0.00	8.68	No
August	0.08	0.0	0.00	7.75	No
September	0.15	0.14	0.14	5.70	No
October	0.30	0.38	0.38	4.03	No
November	0.61	0.77	0.77	2.10	No
December	0.76	0.96	0.96	1.24	No
Annual	**6.51**	**5.15**	**7.45**	**57.90**	**No**

Acronyms:
CIMIS = California Irrigation Management Information System
WETS =

Conceptual Restoration

River Partners proposed the conceptual design in the Conceptual Restoration Plan for the Panorama Vista Preserve (River Partners 2009). Modifications to this plan include potential inclusion of side channels or pools, if feasible, to provide some seasonal wetland habitat.

Under the existing plan, the preserve has been divided into five different locations for which restoration design has been phased (Figure 4). Restoration is currently underway for project Phase 1 (nearing completion) and Phase 2 (expected 3 to 5 years to completion), and in development for project Phases 3, 4, and 5. These phases are currently open to design input and funding opportunities. The scope of the proposed funding opportunities and conceptual restoration design on the site described here is limited to

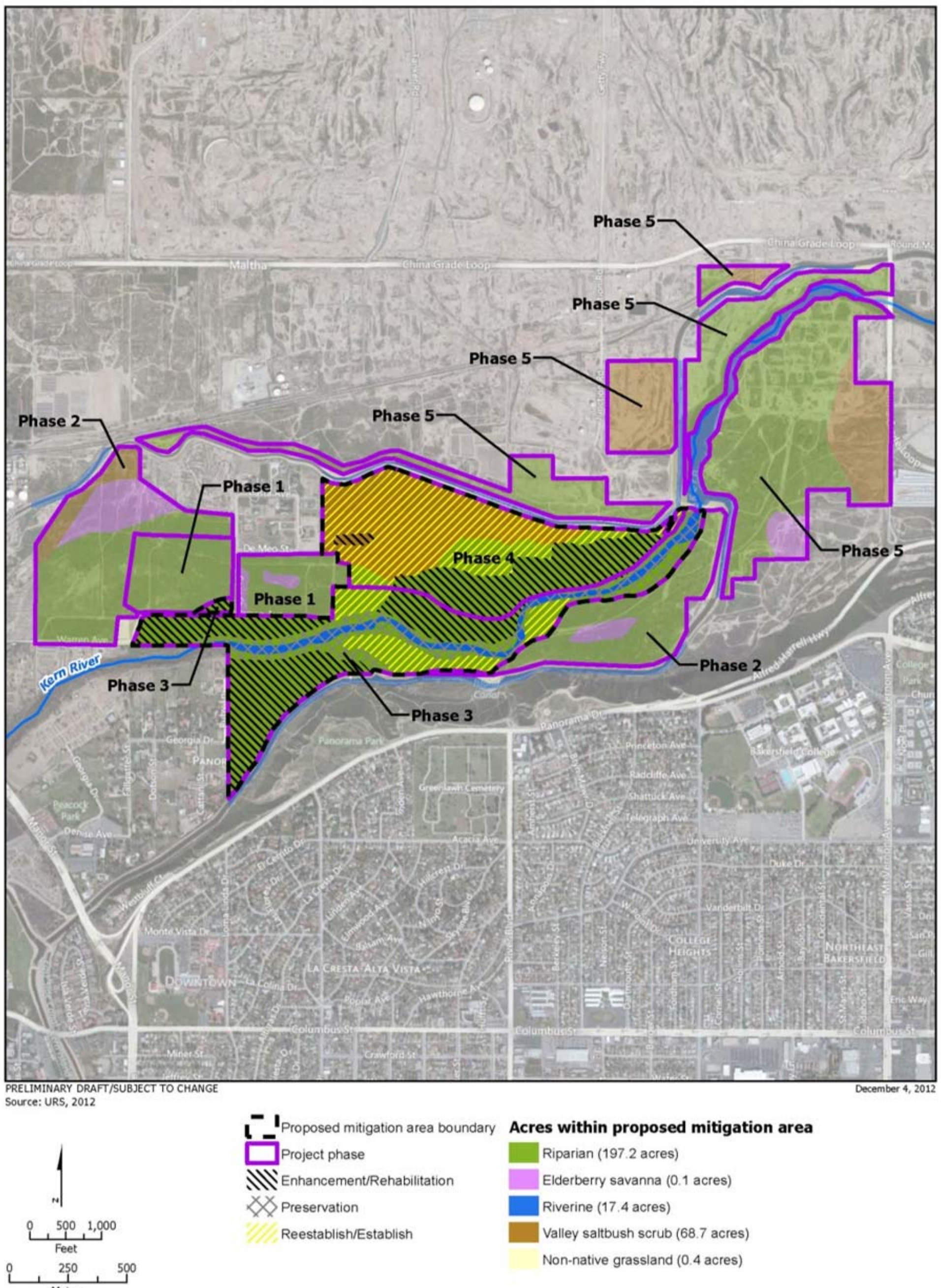


Figure 4
Conceptual restoration map – Panorama Vista Preserve properties

Phase 3 (approximately 151 acres) and Phase 4 (approximately 132 acres), where existing site conditions would benefit from site restoration. Phase 5 lands were not considering in this analysis because they lack suitable habitats and the restoration potential may be limited because of the current active mineral extraction underway at these locations.

The conceptual restoration design proposes reestablishing native vegetation that approximates the historical landscape and nearby reference site vegetation communities. The conceptual plan proposes reestablishing native riparian vegetation along the Kern River and valley saltbush scrub in upland areas beyond the riparian corridor. Additionally, native elderberry savanna, which is present in some of the transition areas between the upland scrub and the riparian scrub, will be reestablished or rehabilitated. If feasible, backwater channels or high-flow channels may be established that provide areas for water collection during periods of high water. It may also be feasible to establish small seasonal wetlands in off-channel depressions that are supported by rainfall and high groundwater. The feasibility of side channel or depressional wetland establishment will be determined after additional topographic and groundwater level assessment.

In addition to the establishment/reestablishment of riparian vegetation and seasonal wetlands, existing, intact riparian and riverine habitat will be preserved through the implementation of a conservation easement on the site. Degraded riparian areas will be rehabilitated through supplemental plantings and weed control.

The establishment/reestablishment of riparian vegetation would consist of planting riparian tree and shrub species in areas where hydrology is appropriate to support their growth. The species palate would be based on a survey of nearby reference sites, and source material would be collected from within the Kern River watershed. Riparian species found along the Kern River that may be appropriate for planting at this site include Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*) elderberry (*Sambucus nigra*) and willow species (e.g., *Salix* spp.). The species palate would be defined based on a survey of nearby reference sites, and source material would be collected from within the Kern River watershed. In a few areas where native riparian vegetation already exists but is degraded, the community will be enhanced through supplemental planting. Areas where native riparian vegetation is currently intact will be preserved.

Riverine rehabilitation/enhancement would be provided in areas where the degraded riparian corridor is being rehabilitated/enhanced. In these areas, the increased shading and habitat diversity provided by the restored riparian vegetation will increase aquatic functions of the riverine system. Elsewhere on the property where riparian cover is already intact, riverine habitat will be preserved through conservation easement restrictions.

In addition, precipitation, Kern River hydrology, and evapotranspiration data were analyzed used to assess the feasibility of created wetlands on the property. Because of the permeable soils, high evapotranspiration, and fluctuating groundwater, the creation of a large seasonal wetland would likely require a clay liner to hold water. Staff at USACE expressed concern about the use of clay liners; for this reason, the proposed wetland creation concept has been abandoned. The creation of smaller seasonal wetlands along the Kern River margins in seasonally inundated areas is proposed as an alternative. However, the exact size and location of these wetlands have not yet been designed and are subject to further site investigation.

On the basis of the Kern River hydrology presented above, the greatest flow through the area that might be available to the project occurs in May and June. This is desirable for irrigating planted species because natural rainfall is available in the winter months (October-April). The Panorama Vista Preserve has been granted rights by the City of Bakersfield to 72 acre-feet of water from the Kern River for use on the property. This water may be extracted for use in supporting wetlands or for irrigation. Using data from the Water Use Planning memo, Phase 3 restoration plantings would require approximately 95 acre-feet of water per year for irrigation. Since this is greater than the allowable 72 acre-feet (and does not include the irrigation needs of other phases that may be occurring concurrently), it is assumed that some amount of supplemental water, perhaps from a separate, localized water system, would be required for meeting irrigation needs.

Another assumption influencing water availability at the site is the discharge volumes from Isabella Dam. This plan also assumes that discharges from the Isabella Dam would continue at their approximate past levels. Although no long-term operations plan for the dam could be identified, current plans exist to increase the capacity of Isabella Dam to better handle storm discharges. This increase in capacity is not expected to affect the overall operations of the dam. The current Environmental Impact Report / Environmental Impact Statement (EIR/EIS) for the Isabella Dam Safety Modifications Project proposes that the volume of peak flows could increase during statistically rare flood events as a result of proposed changes to the dam (USACE 2012).

Table 2 shows the total amount of acreage for preservation, reestablishment/establishment, and rehabilitation at the site. A pre-design California Rapid Assessment Method (CRAM) analysis and wetland delineation would be conducted to assess the current condition of the existing riparian corridor and any existing wetlands. After restoration/establishment is complete, an additional CRAM analysis would need to be done to assess whether the site has provided the improved functions and values necessary to meet the mitigation requirements.

Table 2
Conceptual Restoration Design Area

Resource Type	Acre(s) / Linear Feet	Average CRAM Score	Mitigation Category
Riparian (cottonwood-sycamore, cottonwood willow, willow scrub)	33.5 acres	N/A	Preservation
	118.2 acres	N/A	Rehabilitation/enhancement
	45.5 acres	N/A	Reestablish
Elderberry savanna	0.1 acres	N/A	Rehabilitation/enhancement
Saltbush scrub	2.0 acres	N/A	Rehabilitation/enhancement
	66.7 acres	N/A	Reestablish
Non-native grassland	0.1 acres	N/A	Preservation
	0.2 acres	N/A	Rehabilitation/enhancement
	0.1 acres	N/A	Reestablish
Riverine	17.4 acres	N/A	Preservation
	7,912.0 linear feet	N/A	Preservation

Acronym:
CRAM = California Rapid Assessment Method

Next Steps

- Conduct site visit to refine location selection.
- Collect detailed onsite topography and bathymetry information, if needed.
- Clarify Isabella Dam operation restrictions and upstream diversion rates with diversion records, if available.
- Clarify the locations of upstream flow gage stations.
- Perform statistical analyses of flow data to estimate annual and seasonal water supply reliability, inundation frequency, duration, and depth.
- Review the risk of rerouting the Kern River through the wetland by estimating the frequency of floodplain flows and overtopping of the high ground area.

- Identify local plant species appropriate for wetland and channel revegetation based on the native species currently growing in the preserve.
- Prepare CRAM report for existing features to be restored and features proposed for establishment.

References

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Holland, R. 1986. Preliminary list of terrestrial natural communities of California. Department of Fish and Game, Sacramento, CA.

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River Partners. 2009. Conceptual Restoration Plan for the Panorama Vista Preserve. Bakersfield, Kern County, California. August 2009.

United States Army Corps of Engineers (USACE). 2012. Isabella Lake Dam Safety Modification Project Environmental Impact Statement, Draft. March 2012.

U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

JAN 9 2012

Mr. Zachary Simmons
U.S. Army Corps of Engineers
California South Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Ms. Connell Dunning
U.S. Environmental Protection Agency,
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: Agreement of Purpose and Need for the Fresno to Bakersfield Section of the California High-Speed Train System pursuant to the NEPA/404/408 MOU (December 2010) and Corps Identification Number SPK-2009-01482

Dear Mr. Simmons and Ms. Dunning:

The Federal Railroad Administration (FRA) is writing this letter to conclude Checkpoint A, Definition of Purpose and Need for the Tier 2 California High-Speed Train Fresno to Bakersfield Project Section pursuant to our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed train Program Memorandum of Understanding* (dated December 2010; NEPA/404/408 MOU) among the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (USEPA), FRA and the California High-Speed Rail Authority (Authority).

We have received concurrence from the Corps and USEPA on Checkpoint A for Fresno to Bakersfield in letters to the Authority dated February 2, 2011 and January 20, 2011 (attached). Given that the parties to the NEPA/404/408 MOU have successfully collaborated on the first decision-point FRA has determined the purpose and need for the Fresno to Bakersfield section of the CAHST System as described in the attached letters.

Thank you for your efforts coordinating Checkpoint A of the NEPA/404/408 MOU. We look forward to your continued coordination on future checkpoints for the CAHST System. Should you have questions, please contact Melissa DuMond, FRAs Southwest Regional Manager, at melissa.dumond@dot.gov or (202) 493-6366.

Sincerely,

David Valenstein
Chief, Environment and Systems Planning Division

Attachments:

1. January 20, 2011 USEPA Concurrence, Checkpoint A, Fresno to Bakersfield
2. February 2, 2011 Corps Concurrence, Checkpoint A, Fresno to Bakersfield

Cc:
Michael S. Jewell, Corps
Paul Maniccia, Corps
Jen Blonn, USEPA
Roelof van Ark, CHSRA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

JAN 20 2011

David Valenstein
Federal Railroad Administration
1120 Vermont Avenue, NW, MS 20
Washington, D.C. 20590

Subject: Agreement on Purpose and Need for California High-Speed Rail Project Fresno to Bakersfield Section

Dear Mr. Valenstein:

This letter responds to a December 22, 2010 email from California High-Speed Rail Authority (CHSRA) consultant Bryan Porter which requested agreement on Purpose and Need for the California High-Speed Rail (HSR) Project Fresno to Bakersfield Section. The intent of this letter is to express EPA's agreement with Purpose and Need for the Fresno to Bakersfield HSR Project Section in accordance with the *National Environmental Policy Act (NEPA)/Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* (NEPA/404/408 MOU) dated December 2010.

The Federal Railroad Administration (FRA) is the lead federal agency for compliance with NEPA and other federal laws. CHSRA is serving as the joint-lead under NEPA and is the lead agency for compliance under the California Environmental Quality Act (CEQA). CHSRA proposes to construct, operate, and maintain an electric-powered, steel-wheel-on-steel-rail HSR system that is approximately 800 miles long. The system is planned to reach operating speeds up to 220 mph on mostly dedicated, fully grade-separated tracks with state-of-the-art safety, signaling, and automated train control systems. The system is divided geographically into nine sections for the purpose of environmental analysis and documentation, with CHSRA and FRA planning to develop a separate environmental impact statement (EIS) for each section of the overall system. Per the NEPA/404/408 MOU, EPA is currently engaged in early coordination with CHSRA and FRA as they prepare project-level EISs for the California HSR system. Agreement on Purpose and Need is Checkpoint A of the NEPA/404/408 MOU process.

EPA will review EISs for each section of the California HSR system when they become available. Early coordination through the NEPA/404/408 MOU is intended to assist participating agencies in identifying and addressing challenges as early as possible. Following the early coordination process, EPA maintains its full authority and independence in reviewing EISs

pursuant to NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

Agreement on Purpose and Need

EPA received a draft Purpose and Need submittal for the Fresno to Bakersfield Section of the California HSR Project from CHSRA on October 29, 2010, and EPA provided comments on November 22, 2010. CHSRA provided EPA with an updated draft Purpose and Need submittal on December 2, 2010. On December 8, 2010, CHSRA, EPA and USACE participated in a conference call to discuss this updated draft Purpose and Need submittal. CHSRA then provided EPA with a final Purpose and Need submittal on December 22, 2010. EPA reviewed the December 22, 2010 Purpose and Need submittal and found that CHSRA had adequately addressed EPA's requested changes. Per Checkpoint A of the NEPA/404/408 MOU, this letter provides formal agreement with the Fresno to Bakersfield Section of the California HSR Project Purpose and Need as presented in Section 1.2.2 and Section 1.2.4 of the December 22, 2010 CHSRA Checkpoint A submittal package.

Thank you for requesting EPA's agreement on the Purpose and Need. We look forward to further participation in this project through the NEPA/404/408 MOU process in addition to continuing interagency discussions on the environmental sustainability of the overall HSR system. If you have any questions or comments please contact the lead reviewer for this project, Jen Blonn, at (415) 972-3855 (blonn.jennifer@epa.gov).

Sincerely,

Susan Sturges for

Connell Dunning, Transportation Team Supervisor
Environmental Review Office
Communities and Ecosystems Division

CC Via Email:

Melissa DuMond, Federal Railroad Administration
Dan Leavitt, California High-Speed Rail Authority
Meg Scantlebury, California High-Speed Rail Authority
Bryan Porter, Parsons Brinckerhoff, HSR Project Management Team
Paul Maniccia, U.S. Army Corps of Engineers
Leah Fisher, U.S. Army Corps of Engineers
Zach Simmons, U.S. Army Corps of Engineers
Greg Brown, U.S. Army Corps of Engineers
Veronica Chan, U.S. Army Corps of Engineers
Kellie Berry, U.S. Fish and Wildlife Service

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
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SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

February 2, 2011

Regulatory Division (SPK-2009-01482)

Dan Leavitt
California High Speed Rail Authority
925 L Street
Sacramento, California 95814

Dear Mr. Leavitt:

I am writing in response to your December 22, 2010, request for agreement on the Purpose and Need statement for the proposed Fresno to Bakersfield segment of the California High-Speed Train ("CHST") Project. As per our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* dated December 2010 (NEPA/404/408 MOU), one goal is to reach mutual agreement on the purpose statement so that it can be used by the U.S. Army Corps of Engineers' ("Corps") as the overall project purpose statement for compliance with the U.S. Environmental Protection Agency's Clean Water Act Section 404(b)(1) Guidelines (40 C.F.R. Part 230).

As a cooperating agency for preparation of the Fresno to Bakersfield Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and in fulfillment of our responsibilities under the NEPA/404/408 MOU, the Corps offered its feedback to the Federal Railroad Administration, as well as the California High-Speed Rail Authority ("Authority"), on the draft Purpose and Need statement during our December 8, 2010 meeting. Our substantive comments have been satisfactorily incorporated and/or addressed in the revised Purpose and Need document titled "Checkpoint A: Fresno to Bakersfield Section" dated December 22, 2010. In accordance with Checkpoint A of the NEPA/404/408 MOU, we agree the project purpose is:

> "To implement the Fresno to Bakersfield section of the California HST system to provide the public with electric-powered high-speed rail service that provides predictable and consistent travel times between major urban centers and connectivity to airports, mass transit, and the highway network in the south San Joaquin Valley, and connect the Northern and Southern portions of the system."

Furthermore, the Corps agrees the purpose statement meets the needs of the project and will provide for the development of a reasonable range of alternatives to be evaluated in the Draft EIR/EIS, which will serve to fulfill the procedural and substantive requirements of the NEPA and the 404(b)(1) Guidelines, respectively.

In an effort to expedite our Checkpoint A concurrence, we have refrained from reviewing and commenting on the remaining sections within the Checkpoint A documents. We believe our review of the Administrative Draft EIR/EIS should be sufficient to cover the information included in these documents.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey.*

Please refer to identification number SPK-2009-01482 in any correspondence concerning this project. If you have any questions, please contact Zachary Simmons at our California South Branch, 1325 J Street, Room 1480, Sacramento, California 95814-2922, email *Zachary.M.Simmons@usace.army.mil*, or telephone 916-557-6746. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html.*

Sincerely,

Original Signed

Michael S. Jewell
Chief, Regulatory Division

Copy furnished

Mr. David Valenstein, Federal Railroad Adminstration, 1200 New Jersey Avenue SE- Mail Stop 20, Washington, D.C. 20590-0001
Ms. Susan Sturges and Ms. Jennifer Blonn, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105
Mr. Bryan Porter, Parsons Brinckerhoff, 925 L Street, Suite 1425, Sacramento, California 95814-3704

U.S. Department
of Transportation

**Federal Railroad
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JAN 11 2012

Mr. Zachary Simmons
U.S. Army Corps of Engineers
California South Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Ms. Connell Dunning
U.S. Environmental Protection
Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: Checkpoint Closure Letter: Agreement on the Identification of the Range of Alternatives to be studied in the Fresno to Bakersfield Section of the California High-Speed Train System Environmental Impact Report/Environmental Impact Statement pursuant to the NEPA/404/408 MOU (December 2010) and Corps Identification Number SPK-2009-01482

Dear Mr. Simmons and Ms. Dunning,

The purpose of this letter is to formally close Checkpoint B, identification of the range of alternatives to be studied in the Fresno to Bakersfield Section of the California High-Speed Train (HST) System Environmental Impact Report/Environmental Impact Statement (EIR/EIS) pursuant to our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* (dated December 2010; NEPA/404/408 MOU) among the U.S. Army Corps of Engineers (Corps), the U.S. Environmental Protection Agency (USEPA), the Federal Railroad Administration (FRA), and the California High-Speed Rail Authority (Authority).

During Checkpoint B consultation for the Fresno to Bakersfield Section, the Authority received a letter from the Corps dated July 5, 2011, regarding the alternatives that the Authority and FRA planned to carry forward in the Fresno to Bakersfield Section Project EIR/EIS. In that letter, the Corps disagreed with the elimination of the Hanford West Bypass Alternative from the range of alternatives evaluated in detail in the EIR/EIS. In its comment letter dated October 12, 2011 on the Fresno to Bakersfield Section Draft EIR/EIS, the Corps reiterated its disagreement with the elimination of the Hanford West Bypass Alternative and stated that Checkpoint B would remain open until a formal response letter identifying the status of this alternative was provided to the Corps. In its response dated June 24, 2011 to our request for agreement on the range of alternatives, the USEPA also expressed its concern with the elimination of the Hanford West Bypass Alternative from the Fresno to Bakersfield Section EIR/EIS.

The Authority and FRA decided to re-introduce an alignment alternative west of Hanford to address substantive comments received during public and agency review of the Draft

EIR/EIS, to respond to Corps and USEPA comments referenced above, and to seek ways to reduce or avoid significant environmental effects. The alternative alignment west of Hanford is consistent with the preferred alignment identified in the 2005 California High-Speed Train Program EIR/EIS for the Hanford area, and is approximately 23 miles long. This Hanford WestBypass Alternative diverges from the BNSF Railway near E. Davis Avenue in Fresno County, about 3 miles south of Conejo. It then continues south parallel to and east of S. Clovis Avenue and 14th Avenue, crossing the Kings River west of the community of Laton. The alignment begins moving toward the southeast in the vicinity of W. Fargo Avenue west of Hanford, and rejoins the BNSF Railway in the vicinity of Guernsey near Kansas Avenue. A station to serve the Kings/Tulare region would be located in the area where the HST alignment crosses State Route (SR) 198 and the San Joaquin Valley Railroad.

After evaluating the proposed addition of the Hanford West Alternative and improvements or modifications being considered by the Authority to existing Fresno to Bakersfield alternatives already analyzed in the Draft EIR/EIS, FRA determined, pursuant to 40 CFR 1502.9, that it was necessary to prepare a supplement to the Draft EIS analyzing the potential environmental impacts that might result from the new alternative and modifications of existing alternatives. Therefore, in compliance with the Council on Environmental Quality's (CEQ's) regulations and FRA's Procedures for Considering Environmental Impacts, FRA, in cooperation with the Corps, will prepare a Supplemental Draft EIS for the Fresno to Bakersfield Section. To comply with the California Environmental Quality Act (CEQA), the Authority will prepare a Revised Draft EIR addressing the Hanford West Bypass Alternative and improvements to existing project alternatives.

The Fresno to Bakersfield Revised Draft EIR/Supplemental Draft EIS will address all of the alternatives considered in the Draft EIR/EIS published on August 12, 2011, and the additional Hanford West Bypass Alternative. With the addition of this alternative, the Authority and FRA have accepted the remaining request by the Corps and EPA related to Checkpoint B. Therefore, the FRA formally closes Checkpoint B for the Fresno to Bakersfield Section under the NEPA/404/408 MOU.

Thank you for your efforts coordinating Checkpoint B of the NEPA/404/408 MOU. We look forward to your continued coordination on future checkpoints for the CAHST System. Should you have questions, please contact Melissa DuMond, FRAs Southwest Regional Manager, at melissa.dumond@dot.gov or (202) 493-6366.

Sincerely,

Melissa DuMond FOR

David Valenstein
Chief, Environment and Systems Planning Division

Attachments:

1. June 24, 2011 USEPA Response to Request for Agreement on Range of Alternatives, Checkpoint B, Fresno to Bakersfield and Merced to Fresno
2. July 5, 2011 Corps response to Checkpoint B materials submitted for Fresno to Bakersfield
3. October 12, 2011 Corps comments on the Fresno to Bakersfield Section Draft EIR/EIS

Cc:
Michael S. Jewell, Corps
Paul Maniccia, Corps
Jen Blonn, USEPA
Roelof van Ark, CHSRA

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
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REPLY TO ATTENTION OF

October 12, 2011

Regulatory Division (SPK-2009-01482)

Mr. Dan Leavitt
California High Speed Rail Authority
925 L Street
Sacramento, California 95814

Dear Mr. Leavitt:

This letter is in response to the August 2011, *Fresno to Bakersfield Section Draft EIR/EIS* (DEIR/S) for the proposed Fresno to Bakersfield section of the California High-Speed Train (HST) Project. As a cooperating agency for preparation of the Environmental Impact Statement and in accordance with our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 Integration Process for the California High-Speed Train Program Memorandum of Understanding* dated November 2010 (NEPA/404/408 MOU), this letter is the U.S. Army Corps of Engineers' (Corps) formal response and contains comments that must be addressed prior to issuing the Final EIS. We also request a formal letter response to all comments contained herein.

After reviewing the August 2011 DEIR/S, we are concerned the document may not be sufficient in meeting the Corps' needs under the National Environmental Policy Act (NEPA) and the 404(b)(1) Guidelines, in particular with regard to alternatives and compensatory mitigation for impacts to waters of the United States. The following comments address specific areas where additional information is required and/or corrections should to be made to meet our needs. The comments also include a review of the document for completeness with the 404(b)(1) guidelines.

NEPA/404/408 MOU

1. In accordance with the NEPA/404/408 MOU, the California High-Speed Rail Authority (Authority) and the Federal Rail Administration (FRA) submitted the final Checkpoint B package on April 21, 2011 with the reasonable range of alternatives proposed to be carried forward in the DEIR/S. The Corps responded on July 5, 2011, agreeing with the range of alternatives as proposed, with the exception of the elimination of the Hanford West Bypass Alternative. This alternative was not adequately evaluated and should not have been eliminated from the range of alternatives in the DEIR/S and 404(b)(1) analysis. We have previously requested a formal response letter identifying the status of this alternative. To date, we have not received a response and Checkpoint B is not considered closed.

2. Without closure on Checkpoint B, we will not be able to complete Checkpoint C. Aside from resolution on alternatives, we are troubled with what appears to be only limited progress

towards constructing a draft compensatory mitigation plan that would adequately offset anticipated impacts to waters of the U.S. As you know, we have attended meetings over the past year in which we provided information about our compensatory mitigation regulations and mitigation proposal guidelines, as well as suggestions on potential mitigation proposals and sites. A draft mitigation plan submitted with the Checkpoint C package must contain a proposal with specific details about the elements of the permittee-responsible mitigation project(s). We note that there are no Corps-approved mitigation banks or in lieu fee programs in the area of the proposed HST Fresno to Bakersfield section. We cannot make a preliminary determination on the least environmentally damaging practicable alternative without evaluating a draft mitigation plan.

DEIR/S Comments

1. Address Substrate conditions for aquatic features *(40 CFR 230.11(a) and 230.20)*

2. Address Impacts to substrate and the restoration of temporary fill outlined in 3.7.5(c), pg 3.7-56 *(40 CFR 230.20)*

3.

4. Address potential contaminants in the fill material *(230.11(d))* and a general evaluation of fill material *(40 CFR 230.60, 230.61)*

5. The identification of turbidity and suspended particulates is only briefly mentioned as a potential contaminant. How the project would add to the turbidity and suspended particulates of all effected waters should be included *(40 CFR 230.21)*

6. Impacts to non special-status species need to addressed *(fish, crustaceans, mollusks, and other organisms in the food web 40 CFR 230.31) (other wildlife 40 CFR 230.32)*

7. You need to clarify the cost or funding for station parking lots *(Sec 2.5.3, pg 2-8)*. Who is expected to pay for the parking lots and how much would the Authority or the City be responsible for.

8. The document should specifically reference the screening criteria used in the elimination of alternatives.

9. What happened to the proposed trench within Fresno as proposed in the 4/21/11 checkpoint B letter *(Attachment G, pg G-1)*? Checkpoint B said that there would be a trench/at-grade/elevated combination, the EIS does not mention this alternative.

10. The reference to "other parties" on the top of pg 2-27 needs to be clarified or removed.

11. For HMFs and Stations there is no text describing permanent impacts to wildlife or habitats of concern. For HMFs only, there is no text describing permanent impacts to wildlife corridor.

12. Separate seasonal wetlands/vernal pools into two separate categories in tables 3.7-7 *(pg 3.7-37)* and 3.7-9 *(pg 3.7-48)*

13. Include the following statement about mitigation ratios in Bio-MM #61 (pg3.7-138), "The following ratios are proposed as a minimum for compensation for permanent impacts, final ratios will be determined in consultation with appropriate agencies." This statement should be at the beginning of the ratio discussion, not as a bullet below the proposed ratios.

14. For Table S-2 *(pgs S-23, 24)* clarify that the term "jurisdictional waters" includes waters of the US and waters of the state

15. The project termini in section 2.3.2 *(pgs 2-17, 18)* has two sets of project review termini. Clinton Ave in Fresno to Oswell St in Bakersfield is a larger review area identified for the subsections and in the first paragraph on page 2-18 as the termini for the alternatives analysis report. The smaller review area from Clinton Ave in Fresno to Oswell St in Bakersfield is identified in the last paragraph on page 2-17 as the review area for the EIS. Why was the review area for the EIS shortened by approximately 5.5 miles from the review area for the alternatives analysis? Based on the statement in the first paragraph on page 2-18, the longer review area starts and stops at logical termini. The shortening of the review area within Bakersfield removes approximately 2.5 miles of each alternative from Baker St to the point where they come together at Oswell Street, thus removing those impacts from the alternatives analysis. The LEDPA determination and analysis under NEPA is incomplete without inclusion of these additional impacts since the determination of an alternative would determine which path is taken through the additional 2.5 miles to Oswell Street with these additional impacts never being analyzed or publically reviewed.

16. The elimination of the West Hanford alternative *(pg 2-25)* was not agreed to by the Corps and requires greater analysis. Data provided by the Authority shows that this alternative would result in fewer impacts to riverine habitat, riparian habitat, and residential and commercial parcels, but more impacts to seasonal wetlands, threatened and endangered species, and indirect impacts to residential communities. This alternative meets the project purpose and need and requires greater analysis within the EIS in order to be eliminated. Very little information was included about this alternative and why it was eliminated. This alternative must be included in greater detail. Multiple comments have been received for the Kings County portion of this project and the full review of an additional alternative within this area is warranted.

17. Temporary impacts – *(pg 3.7-56, Bio-MM#20, pg 3.7-126, Bio-MM#45, pg 3.7-132).* Due to the scope and duration of the project, we do not agree that all construction impacts can be adequately restored to pre-project conditions in every location/situation. We are unable to concur that these impacts would be temporary and recommend that temporary impacts be reevaluated and considered permanent in locations where waters would be filled during the construction period. The placement of geotextile fabric and gravel or the stockpiling of topsoil have been successfully used in previous projects where the impact would only last a few months. Our understanding is that the construction period would last several years and the landscape would be degraded through compaction and other land uses depending on the specific location. We suggest that waters be avoided by placing fencing around the features or by implementing

other avoidance measures in order to leave the substrate in a pre-project condition. Although the feature would still be temporarily impacts, this would allow for successful restoration of temporary impacts upon completion of construction activities.

18. The duration of the construction period is not identified. Section 2.8 defines the construction plan and multiple parts thereof, but fails to identify a timeline for completing the work. The estimated duration of the construction period should be clearly stated.

19. Indirect impacts to waters of the U.S. need to be addressed and to the degree possible quanitified. Include acreages of features that would be indirectly impacted. The study area for indirect impacts has been identified as 250 feet on either side of the 100-foot project footprint *(pg 3.7-7)*. Please provide acreages of features within this study area that would be indirectly impacted

20. The "Seasonal Wetlands and Vernal Pools" category in the Aquatic Communities impact tables *(Table 3.7-7, -9, -11)* should be separated into two categories of wetland type.

21. Impacts to waters o the U.S. resulting from crossings needs to be clarified by crossing type. The current analysis relies on the number of water bodies being crossed. Although, potential crossing types are identified *(pg 3.8-41, -42)*, a commitment should be made to which types of crossing would be installed at each type of waterway/track elevation. This would allow for an accurate analysis of the project impacts and increase the amount of avoidance. Once the crossing type is identified, you can also identify measures to reduce the impacts resulting from that crossing type. This would also allow reviewers to provide specific feedback on the type of crossing proposed.

22. Stormwater Pollution Prevention Plan best management practices *(pg 3.8-58, -59)*. The list of BMPs should be those actually proposed for the project rather than a list of "typical BMPs". The inclusion of BMPs in the EIS that may not be part of the final project would alter the impact analysis. Since the SWPPP has not been prepared at this time, a statement can be included that, "BMPs will include, but are not limited to, the following".

23. Agricultural Impacts Tables *(Table 3.14-5, -6, pgs 3.14-32)*. Format these tables as delta tables similar to the biological and aquatic resource impact tables so that the impacts from each alternative bypass can be directly compared to the opposing section of the BNSF alignment. In order to make the tables easier to read and consistent with other tables, replace the "0" with a "-" when the cell is not applicable (i.e. the bypass is not in that county).

24. What is the actual acreage required for the HMF site? Pages 2-14 and 2-79 state that the HMF requires approximately 150 acres while page 3.1-4 says up to 154 acres. This is not consistent with the DEIR/S for the Merced to Fresno section which states that the HMF requires either 154 acres *(pg 2-15)*, between 231 and 401 acres depending on the site *(Table 2-13, pg 2-82)*, or up to 300 acres *(pg 3.1-4)*. Verify the acreage required for the HMF and if this is dependent on the actual site selected.

25. There is some confusion about the amount of aquatic resources that would be impacted in the Corcoran area as indicated in Table 3.7-9 *(pg 3.7-48)*. The Corcoran Bypass, Corcoran

Elevated, and corresponding BNSF Alternative all appear to analyze the same segment between Idaho Ave and Ave 136 *(pg 2.51)*. The following inconsistencies appear with the riverine, seasonal wetlands and vernal pools, and lacustrine habitat.

a. The table indicates that the Corcoran Bypass Alternative has 9.12 acres of riverine habitat while we can only count approximately 6.5 acres in the delineation. The table indicates that the 9.12 acres is 8.04 acres less than the BNSF alternative for this section. That would mean that the BNSF alternative has 17.16 acres of riverine impacts within the Corcoran section. We were only able to count approximately 7.5 acres in the delineation. The Corcoran Elevated Alternative has 2.15 acres, which is 1.35 acres less than the BNSF Alternative. This would indicate that the BNSF Alternative only has 3.5 acres. How many acres are actually in the corresponding segment of the BNSF Alternative?

b. The Corcoran Bypass has 1.23 acres of seasonal wetlands and vernal pools which is 0.24 acres less than the BNSF Alternative. The BNSF Alternative should therefore have 1.47 acres. This category is not applicable to the Corcoran Elevated Alternative, as indicated with a "-" within the cell. This would indicate that neither the Corcoran Elevated nor the BNSF Alternative have any seasonal wetland and vernal pool impacts. Are there seasonal wetlands and vernal pools within the BNSF alignment? If so, how many?

c. There is also a discrepancy in the amount of Lacustrine habitat. The Corcoran Bypass Alternative has 0.04 acres of impacts, 0.80 less than the BNSF Alternative. The BNSF Alternative should therefore have an approximate 0.84 acres. The Corcoran Elevated Alternative would have 0 acres which is 0.42 acres less than the BNSF Alternative. The BNSF Alternative should therefore have 0.42 acres. How many acres of lacustrine impacts does the BNSF Alternative have?

26. Verify that the list potential cumulative effects in tables 3.19-1 through 3.19-7 are consistent and accurate for all projects. Applications have been submitted for a Department of the Army for multiple projects listed. These projects have impacts to wetlands and other aquatic resources as well as threatened and endangered species that are not listed here. There are also inconsistencies with similar projects that have different effects listed.

27. Chapter 3.19 does not analyze the cumulative impacts by alternative. The cumulative impacts must be shown separated by alternative in order to better inform the selection of a preferred alternative and the LEDPA. Based on the location of the alternatives and the resources or receptors being affected, the cumulative effects would differ.

28. How do you know that permanent losses that may occur to unknown cultural resources would result in moderate cumulative impacts? Without knowing what the resources may be, there is no way of knowing what level of impacts would occur.

We appreciate the opportunity to provide comments on the DEIR/S. We continue to be committed to working collaboratively with you to resolve issues, avoiding the need for

supplemental documentation and delays in making a timely permit decision. If you have any questions, please contact Zachary Simmons in our California South Regulatory Branch, 1325 J Street, Room 1480, Sacramento, California 95814-2922, email *Zachary.M.Simmons@usace.army.mil*, or telephone 916-557-6746.

Sincerely,

ORIGINAL SIGNED

Michael S. Jewell
Chief, Regulatory Division

Copy Furnished

Mr. David Valenstein, Federal Railroad Adminstration, 1200 New Jersey Avenue SE- Mail Stop 20, Washington, D.C. 20590-0001

Ms. Connell Dunning, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105

Mr. Jason Brush, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105

Mr. Bryan Porter, Parsons Brinckerhoff, 925 L Street, Suite 1425, Sacramento, California 95814-3704

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUN 24 2011

David Valenstein
Federal Railroad Administration
1120 Vermont Avenue, NW, MS 20
Washington, D.C. 20590

Dan Leavitt
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

Subject: Response to Request for Agreement on Range of Alternatives for California High-Speed Rail Project Merced-to-Fresno and Fresno-to-Bakersfield Sections

Dear Messrs. Valenstein and Leavitt:

Thank you for the opportunity to provide comments and recommendations in advance of publication of the Draft Environmental Impact Statements (Draft EIS) for the Merced-to-Fresno and Fresno-to-Bakersfield sections of the California High Speed Rail (HSR). We hope that our early feedback and coordination will lead to early resolution of any potential environmental resource and permitting challenges. The Federal Railroad Administration (FRA) is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and other federal laws, and California High Speed Rail Authority (CHSRA) is serving as the joint-lead under NEPA and is the lead agency for compliance under the California Environmental Quality Act (CEQA).

EPA feedback is aimed at integrating the future requirements of the Clean Water Act (CWA) Section 404 permitting process with NEPA requirements. This integration process is further described in the *NEPA/ CWA Section 404/Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program Memorandum of Understanding* (MOU) dated December 2010. To facilitate effective integration of CWA Section 404 and NEPA for this project, EPA continues to coordinate closely with the Army Corps of Engineers (Corps) and we concur with the recommended range of alternatives provided by the Corps in the Merced-to-Fresno Checkpoint B agreement letter (June 14, 2011). We also commend CHSRA for working to reduce impacts to aquatic resources along the BNSF alignment of the Fresno-to-Bakersfield section.

Merced-to-Fresno Section

EPA agrees with CHSRA and FRA's decision to carry forward the following station, alignments, and heavy maintenance facilities (HMF) for analysis in the Merced-to-Fresno Draft EIS:

- Merced Transit Center Station Alternative
- UPRR/SR 99 Alignment Alternative with Design Options East and West of Chowchilla
- BNSF Alignment Alternative with Design Options Between Merced and Le Grand

- Hybrid Alignment Alternative
- Castle Commerce Center HMF Site Alternative
- Harris-DeJager HMF Site Alternative
- Fagundes HMF Site Alternative
- Gordon-Shaw HMF Site Alternative
- Kojima Development HMF Site Alternative

In addition, the Corps June 14, 2011 letter highlighted the following issues:

1) The BNSF alternative in this section would likely have CWA Section 404 permitting challenges due to aquatic resource impacts, and

2) The Western Madera alternative should not be eliminated from analysis in the Draft EIS.

We concur with these two points.

Fresno-to-Bakersfield Section

EPA agrees with CHSRA and FRA's decision to carry forward the following stations, alignments, and heavy maintenance facilities (HMF) for analysis in the Fresno-to-Bakersfield Draft EIS:

- BNSF Alignment Alternative with Two Station Alternatives in Fresno (Mariposa and Kern), the Kings/Tulare Regional Station, and a Station in Bakersfield (Bakersfield North)
- Corcoran Elevated Alternative
- Corcoran Bypass Alignment Alternative
- Allensworth Bypass Alignment Alternative
- Wasco-Shafter Bypass Alignment Alternative
- Bakersfield South Alignment Alternative with a Bakersfield South Station Alternative
- Fresno Works – Fresno HMF Site Alternative
- Kings County – Hanford HMF Site Alternative
- Kern Council of Governments – Wasco HMF Site Alterative
- Kern Council of Governments – Shafter East HMF Site Alternative
- Kern Council of Governments – Shafter West HMF Site Alternative

EPA also recommends that the West of Hanford Bypass Alternative be included in the reasonable range of alternatives and not be eliminated from further study at this time.

Finally, as discussed during last week's conference call between our agencies, we recommend that FRA and CHSRA defer a decision on the "wye" connection alignments between the Merced-to-Fresno Section and the San Jose-to-Merced Section at this time. The future San Jose-to-Merced EIS provides a forum for more detailed discussions about this important connection in the HSR system.

Thank you for requesting EPA's agreement on the range of alternatives. We look forward to further participation in the development of environmental documents for this project and the plan for overall environmental sustainability of the HSR system. EPA will ultimately review EISs for each section of the California HSR system pursuant to NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. EPA will also review CWA Section 404 permit applications for each HSR section for compliance with EPA's 404(b)(1) Guidelines (40 CFR 230.10). We appreciate this opportunity to address potential environmental issues as early as possible. If you have any questions or comments please contact the NEPA lead for this project, Jen Blonn, at (415)

972-3855 (blonn.jennifer@epa.gov) or the aquatic resources lead for this project, Sarvy Mahdavi, at (415) 972-3173 (mahdavi.sarvy@epa.gov).

Sincerely,

Connell Dunning

Connell Dunning, Transportation Team Supervisor
Environmental Review Office
Communities and Ecosystems Division

CC Via Email:

Melissa DuMond, Federal Railroad Administration
Dan Leavitt, California High-Speed Rail Authority
Lupe Jimenez, California High-Speed Rail Authority
Bryan Porter, Parsons Brinckerhoff, HSR Project Management Team
Paul Maniccia, U.S. Army Corps of Engineers
Zach Simmons, U.S. Army Corps of Engineers
Greg Brown, U.S. Army Corps of Engineers
Veronica Chan, U.S. Army Corps of Engineers
Kellie Berry, U.S. Fish and Wildlife Service

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

July 5, 2011

Regulatory Division (SPK-2009-01483)

Mr. Dan Leavitt
California High Speed Rail Authority
925 L Street
Sacramento, California 95814

Dear Mr. Leavitt:

I am writing in response to your April 21, 2011 and the June 2, 2011, Checkpoint B letters, and the March 2011, Revised Checkpoint B Summary Report for the proposed Fresno to Bakersfield segment of the California High-Speed Train ("CHST") Project. In accordance with our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 Integration Process for the California High-Speed Train Program Memorandum of Understanding* dated November 2010 (NEPA/404/408 MOU). This letter is our formal response.

As a cooperating agency for preparation of the Merced to Fresno Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and in fulfillment of our responsibilities under the NEPA/404/408 MOU, we offered feedback to the Federal Railroad Administration as well as the California High-Speed Rail Authority ("Authority") on the range of alternatives during meetings on January 28, March 17, and May 17, 2011 as well as direct communication with your staff and consultants. The Authority has provided additional information and clarification per our requests. The alternatives were evaluated based on the ability to meet the project purpose and the project performance objectives and evaluation measures presented in the May 2010, *Preliminary Alternatives Analysis Report*.

After reviewing the data provided, including screening criteria and support information, we agree the following alternatives should be carried forward as part of the reasonable range of alternatives to be studied in the EIR/EIS:

1. <u>Stations</u>
   a) Fresno Station–Mariposa Alternative
   b) Fresno Station–Kern Alternative
   c) Bakersfield Station–North Alternative
   d) Bakersfield Station–South Alternative

2. <u>North-South Alignments</u>
   a) BNSF Alternative
   b) Corcoran Elevated Alternative
   c) Corcoran Bypass Alignment
   d) Allensworth Bypass Alignment
   e) Wasco-Shafter Bypass Alignment
   f) Bakersfield South Alignment (D2-N)

3. Heavy Maintenance Facility
   a) BNSF Alternative
   b) Hanford West Bypass Alternative
   c) Corcoran Elevated Alternative
   d) Corcoran Bypass Alignment
   e) Allensworth Bypass Alignment
   f) Wasco-Shafter Bypass Alignment
   g) Bakersfield South Alignment (D2-N)

We do not agree that the Hanford West Bypass Alternative should be eliminated from the EIR/EIS. This alternative was proposed for elimination because it was determined unsuitable for a regional station proposed between Hanford and Visalia. The data provided for this section shows that this alternative would result in less impacts to riverine habitat, riparian habitat, and residential and commercial parcels, but more impacts to seasonal wetlands, threatened and endangered species, and indirect impacts to residential communities. This alternative meets the purpose and need and is recommended to be carried forward in the reasonable range of alternatives.

We appreciate the opportunity to provide input on the range of alternatives and look forward to your letter identifying the status of each alternative that we did not agree. If you have any questions, please contact Mr. Zachary Simmons at our California South Branch, 650 Capitol Mall, Suite 5-200, Sacramento, California 95814-4708, or by email at: *Zachary.M.Simmons@usace.army.mil*, or by telephone 916-557-6746. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html.*

Sincerely,

ORIGINAL SIGNED

Michael S. Jewell
Chief, Regulatory Division

Copy Furnished:

Mr. David Valenstein, Federal Railroad Adminstration, 1200 New Jersey Avenue SE- Mail Stop 20, Washington, D.C. 20590-0001
Ms. Connell Dunning, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105
Mr. Jason Brush, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105
Mr. Bryan Porter, Parsons Brinckerhoff, 925 L Street, Suite 1425, Sacramento, California 95814-3704

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

December 19, 2013

Regulatory Division (SPK-2009-01482)

Mark McLoughlin
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, California 95814

Dear Mr. McLoughlin:

I am writing in response to your November 12, 2013, Checkpoint C Package and the November 27, 2013, request for concurrence on the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) determination for the proposed Fresno to Bakersfield segment of the California High-Speed Train (CHST) Project. In accordance with our *National Environmental Policy Act/Clean Water Act Section 404/Rivers and Harbors Act Section 14 Integration Process for the California High-Speed Train Program Memorandum of Understanding* dated November 2010 (NEPA/404/408 MOU). This letter is our formal response.

As a cooperating agency for preparation of the Fresno to Bakersfield Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and in fulfillment of our responsibilities under the NEPA/404/408 MOU, we offered feedback to the Federal Railroad Administration as well as the California High-Speed Rail Authority (Authority) on the Preliminary LEDPA determination and draft Compensatory Mitigation Plan. We provided comments on May 2, 2013, regarding the draft Checkpoint C Summary Report and Information Packet submitted on April 18, 2013. We have also discussed these comments and the proposed alternatives in multiple meetings with your staff and consultants.

After reviewing the data provided, we concur that the Preferred Alternative from the proposed Fresno Station to Seventh Standard Road is the Preliminary LEDPA. The Preliminary LEDPA consists of the BNSF Alternative with the following area alternatives, BNSF-Hanford East, Kings/Tulare Regional Station-East, Corcoran Bypass, Allensworth Bypass, and BNSF-Through Wasco-Shafter. We understand that the alignment from Seventh Standard Road to the terminus in Bakersfield, including the proposed Bakersfield Station, will be evaluated at a later time.

In addition, we concur that the draft Compensatory Mitigation Plan may provide sufficient mitigation to meet the needs of the project under Section 404 of the Clean Water Act. However, we will continue to work with the Authority as further refinements of this plan are necessary. The plan must include adequate restoration or establishment in combination with the proposed preservation. We encourage you to continue to seek aquatic restoration/establishment

opportunities near existing preserved lands in the Allensworth area. This may include the Smith Offering or other appropriate sites.

The Corps cannot make a permit decision until we receive a final mitigation plan in accordance with 33 CFR Part 332, Compensatory Mitigation for Losses of Aquatic Resources. The plan needs to follow a watershed approach and offset all functions and services impacted.

We appreciate your willingness to work with this office to reach this concurrence. If you have any questions, please contact Zachary Simmons at our California South Branch, 1325 J Street, Room 1350, Sacramento, California 95814-2922, email *Zachary.M.Simmons@usace.army.mil*, or telephone 916-557-6746. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Michael S. Jewell
Chief, Regulatory Division

Copy furnished

Mr. David Valenstein, Federal Railroad Adminstration, 1200 New Jersey Avenue SE- Mail Stop 20, Washington, D.C. 20590-0001
Ms. Connell Dunning, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne Street, San Francisco, California 94105
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